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ABSTRACT

Although written with the classroom teacher in mind, this learning module on firearms safety can be adapted by leaders of camps, 4-H clubs, outdoor educators, scouting organizations or any workers with junior and senior high school youth. The self-contained unit includes information on the subject, lesson plans, activities, class exercises, tests, suggested visual aids, and references, all contributed by experienced instructors who have taught the subject and successfully used the activities. An introductory section presents goals and objectives, ethical concerns of using firearms and facts about and functions of firearms in our society. Principles of firearms safety for field and home use are stressed. A section on history traces the development of gunpowder, early ignition systems, and ammunition. Interesting facts and drawings are provided to encourage discussion. Six lesson plans, which list all equipment and materials needed, teach how to identify and operate various types of rifles, shotguns, and handguns. Included as appendices that can be directly reproduced as student handouts are a history of firearms' actions, a history of firearms crossword puzzle, parts of a firearm, ammunition components, a home firearms check list, and a word game using firearms phrases. A sample written and practical exam is included along with a glossary and bibliography to provide additional teacher information. (NEC)

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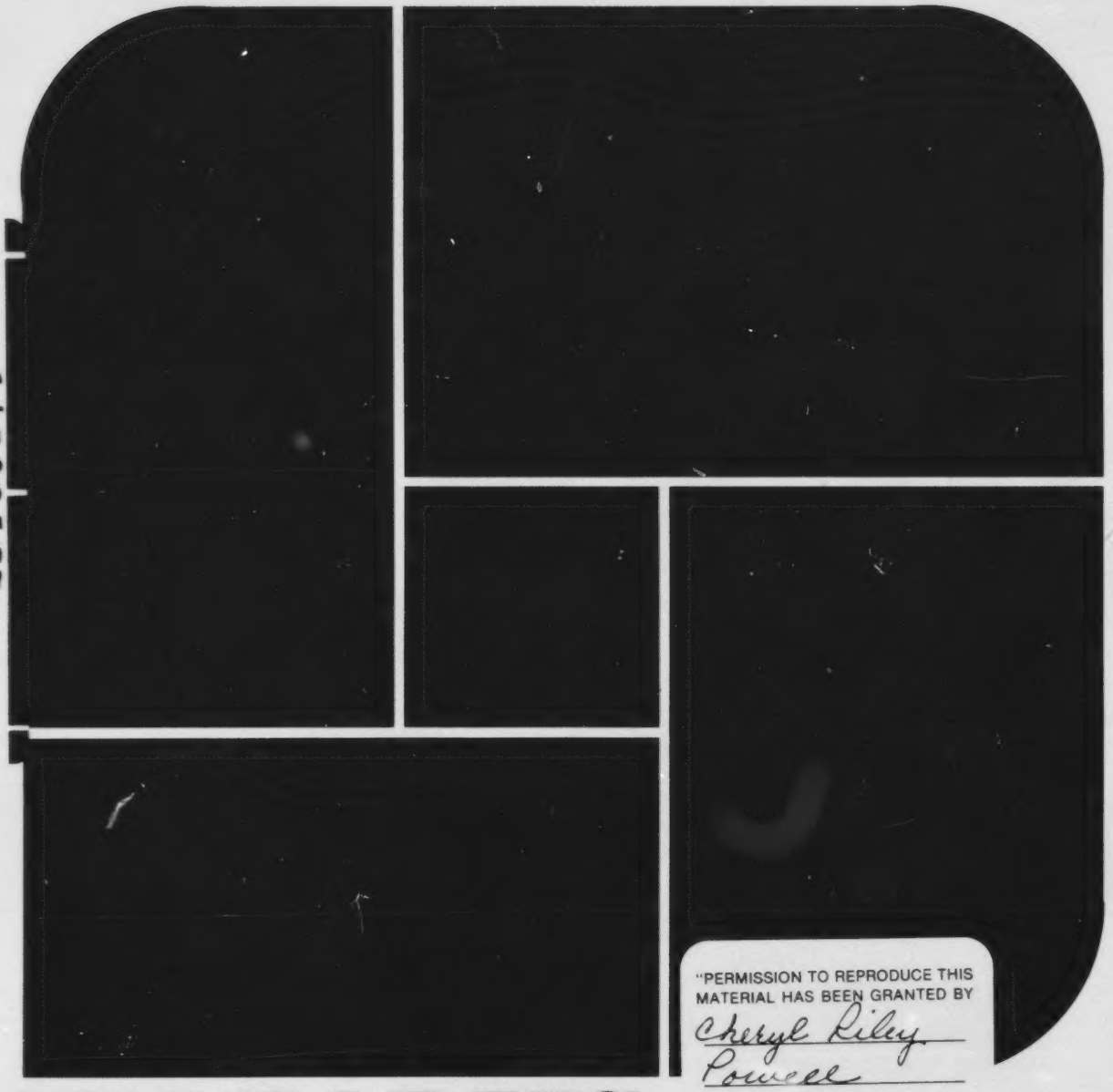

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FIREARMS SAFETY

SHOOTING SKILLS SERIES

RC012005

A PROGRAM OF THE MISSOURI DEPARTMENT OF CONSERVATION

OUTDOOR SKILLS EDUCATION MODULES

Missouri's natural resources belong to all its citizens. More and more people are going outdoors to hunt, fish, boat, hike, camp, explore, and learn about nature. The skills they use in the outdoors can have a direct effect on resources. That's why it is important to educate youth and adults in how to use the outdoors wisely and responsibly through schools, community groups, and agencies.

The Outdoor Skills Education Unit of the Department of Conservation, in cooperation with the Department of Elementary and Secondary Education, is developing educational programs to teach Missourians how to use wisely and skillfully the state's many resources for outdoor recreation. The materials, presented as modules, can be used individually or combined in a series by schools, camps, clubs, scouting groups, and other youth or adult organizations. Topics include the shooting sports, casting and angling, trapping, archery, backpacking, camping, aquatics, map and compass, and other skill areas.

Each module is a self-contained unit that includes information on the subject, lesson plans, activities, class exercises, tests, suggested visual aids, and references. Experienced instructors who have taught the subjects and successfully used the activities have written the modules.

For additional information on conservation and outdoor education programs, write the Education Section, Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102.

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INSTRUCTOR MANUAL

FIREARMS SAFETY

SHOOTING SKILLS SERIES

MISSOURI DEPARTMENT OF CONSERVATION
EDUCATION SECTION

By Rodney J. Green
Edited by Cheryl Riley Powell
Illustrated by Donna Drew

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These materials are made possible by the one-eighth of one percent Conservation Sales Tax.

The Missouri Department of Conservation
Outdoor Skills Education
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Jefferson City, Mo. 65102

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About the author

Rod Green has worked as an education consultant for the Department of Conservation since September, 1976. Prior to that, he taught high school for eight years in northwest Missouri. While teaching he integrated into his biology curriculum the first elective course that students could take for outdoor education credit.

Rod received his instructor certification from the National Rifle Association while attending the University of Wyoming where he studied wildlife biology. He holds B.S. and M.S. degrees from Northwest Missouri State University.

In addition to his conservation education work with teachers and students, Rod writes a weekly column, "Outdoors in Northwest Missouri," which is published by 19 newspapers in the state. He also has sold articles to several major hunting magazines. Rod, his wife, and two daughters live in Albany.

How to use this module

This module has been produced for you who teach, or in some way work with, junior and senior high school youth. The material has been written with the classroom teacher in mind, but it also can be adapted by leaders of camps, 4-H clubs, scouting organizations, and other youth groups. A variety of information and activities has been included to make the module useful to as many groups as possible. Each module may be used individually or combined with other modules for a more extensive course.

The Firearms Safety module contains:

Introductory Information — Goals and objectives approved by the Missouri Department of Elementary and Secondary Education are listed. Questions such as "Why teach this subject?" are answered and a brief discussion of the ethical concerns of using firearms is presented.

History — An Annotated Chronology of Firearms Development is included as one chapter of the module. Interesting facts and drawings are provided to encourage instructors to discuss the history of firearms.

Subject Information — Subject material covered includes how to identify and operate firearms, ammunition, and the principles of firearms safety.

Lesson Plans — Field-tested methods of teaching this material are provided in six lesson plans. The time for each lesson is only suggested and will vary from instructor to instructor. All equipment and materials you will need for activities are listed. The Department of Conservation has equipment and films for your use.

Student Handouts — Included as appendixes are a history of firearms' actions, a history of firearms crossword puzzle, parts of a firearm, ammunition components, a home firearms check list, and a word game using firearms phrases. These are designed so you can reproduce them for your students.

Suggested written and practical examination — If you

are a classroom teacher and want to evaluate your students' mastery of the material you have been teaching, a sample written and practical exam is included. Test questions are keyed directly to the objectives for the module. Answers also are provided.

Glossary and Bibliography — These are provided as additional information which may help you in teaching the subject in more detail.

Outdoor Skills Education Specialists are assigned to seven regions throughout the state. They will assist you in obtaining materials and scheduling equipment and films that are available from the Department of Conservation. They also offer workshops to provide training and certification in several outdoor skills. Check the last page of this module for names, addresses, and regions.

Review Committee

The material in this module has been reviewed by the following people:

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Questionnaire

Please help us evaluate the effectiveness and use of our materials by completing the following questionnaire and mailing it to the Missouri Department of Conservation, Outdoor Skills Education, P. O. Box 180, Jefferson City, MO 65102.

How did you obtain a copy of this module? _____

Have you used this material? Why or Why not? _____

Your position _____

Age group you teach _____

CONTENT AND FORMAT

Were you given enough information to teach this course?

Enough _____ Not Enough _____ Too Much _____

Comments: _____

_____

Was material presented in a manner easy for you to use?

Yes _____ No _____

Comments: _____

_____

What information would you add or subtract? _____

_____

LESSON PLANS AND ACTIVITIES

Did you use the lesson plans?

All of them _____ Some of them _____ None of them _____

Were the time periods allowed for activities adequate?

Adequate _____ Too much time _____ Not enough time _____

Comments: _____

_____

_____

Which activities did students most enjoy? _____

What additional activities would you include? _____

What suggestions do you have for future modules? _____

What topics would you like to see covered? _____

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Topic Outline

I. Introduction
   A. Importance of knowing firearms safety
   B. Ethics
   C. Functions of firearms in our society
   D. Facts about firearms and firearms-related accidents

II. History of Firearms Development
   A. Gunpowder
   B. Early Ignition Systems
      1. Matchlock
      2. Wheellock
      3. Flintlock
      4. Caplock
   C. Ammunition
      1. Bullet
      2. Rimfire cartridge
      3. Centerfire cartridge
      4. Smokeless powder

III. Parts and Operation of Firearms
   A. Definition of firearm
   B. Types
      1. Rifles
      2. Shotguns
      3. Handguns
   C. Parts
      1. Actions
         a. shoulder firearms
            (1) bolt
            (2) lever
            (3) pump
            (4) hinge
            (5) semi-automatic
         b. handguns
            (1) semi-automatic
            (2) revolver
      2. Stocks
      3. Barrels
         a. rifling
         b. choke
         c. caliber
         d. gauge
      4. Trigger
      5. Safeties
      6. Sights
         a. rifle
            (1) open
            (2) aperture (peep)
            (3) telescopic
         b. handgun
            (1) open

(2) scope
c. shotgun — single or dual bead

IV. Ammunition
A. How ammunition fires
B. Basic components
1. Case
2. Primer
3. Powder charge
4. Bullet or shot charge
C. Types of ammunition
1. Cartridges
2. Shotgun shells
D. Reloading
E. Selecting
F. Storing

V. Principles of Firearms Safety
A. Ten Commandments of Firearms Safety
B. Primary rules
1. Always point muzzle in a safe direction.
2. Make sure firearm is unloaded before handling.
3. Always treat firearm as though it were loaded.
C. Safety in the home — proper cleaning and storage
D. Safety in the field — proper methods of carrying firearms
E. Safety in transport

Introduction

Goals of the module

To reduce accidents that are caused by not understanding firearms and how to handle them safely.

To develop a healthy attitude and respect for firearms and their legitimate use in our society.

Purpose of the module

The firearms safety module has been developed to fill a void that often exists in educating young people about firearms. Many state wildlife agencies and hunter groups have developed and financed excellent hunter education programs. Instruction, however, is needed for youth who are not interested in hunting, but who still may encounter a firearm in the family closet or while playing with the youngster next door. Since three out of every four American families own guns, chances are good that a person will come into contact with a firearm sometime during his or her life.

Firearms safety courses in schools, camps, youth clubs and scouting organizations can educate young people about the proper function of firearms in our society, teach them how to safely handle firearms, and replace fear of guns with proper respect for firearms. The Missouri Department of Conservation promotes sport hunting and harvest, but it also recognizes the importance of educating all people about firearms, whether or not they hunt or own guns, to avoid the accidents that are caused by ignorance and disrespect.

Teachers and youth leaders who want to go a step further and establish a shooting sports program can combine lessons in firearms safety with more specific instructions in hunter education, rifle, shotgun, handgun, black powder, trap, or skeet. Modules are being written on all these topics. Actual shooting experience adds an important practical dimension and provides recreational and competitive enjoyment.

It is not the purpose of this module, however, to develop skills in shooting. Rather, information is included to increase knowledge of firearms and ammunition and to teach how to handle firearms safely.

Content of the module

The department's firearms safety module is written for use with junior and senior high school students. This material is organized into seven 50-minute presentations for classroom use; however, it can be adapted to other teaching environments. Lessons cover history, identification and operation of firearms, ammunition, and safety principles in the home, in the field, and while transporting firearms. Shooting demonstrations and activities are optional.

Instructors should let students see and handle actual firearms so they will better understand what is being

discussed. Daily lesson plans are included along with information on what materials are needed for teaching and additional reference sources. Audio-visual aids such as slides, films, and charts may be scheduled by contacting the Department of Conservation.

All potential instructors are to receive training and certification before they instruct in the shooting sports.

Objectives

Upon completion of a class in firearms safety, a student should be able to do the following:

1. If told or given a written chronology of firearms history and a list of words and names, fill out a crossword puzzle on the history of firearms using the words and names.
2. Define a firearm; name and describe the three major firearms.
3. If provided a drawing of a firearm, identify its action, barrel, stock, trigger, trigger guard, muzzle, safety, sights, and magazine.
4. If given drawings of the actions of shoulder guns and handguns, identify each action and explain how it operates. If handed actual firearms, identify and open the actions.
5. List the components of ammunition — both a cartridge and shotgun shell — and describe what part each plays in firing the ammunition.
6. Define the following terms: caliber, gauge, rifling, choke, centerfire cartridge, rimfire cartridge.
7. Describe the safest way firearms and ammunition should be stored in the home.
8. List the three basic rules of firearms safety.
9. Demonstrate or describe the two-hand carry.
10. Describe a safe method for transporting firearms in any vehicle.

Ethics

The use of firearms is a controversial subject. Proponents and opponents take strong emotional stands. Facts are sometimes distorted.

As soon as guns were manufactured for general use, they were used for crime, as well as for protection and collection of food. Just as the first stone implements were used for tribal warfare, guns, too, have been misused for robbery and murder. Their use in crime has been an ethical concern for centuries. But people, not guns, commit crimes. Doing away with firearms will not end violence and crime, for these are social problems that cannot be solved with gun control laws.

People, not guns, commit crimes.

In writing the U.S. Constitution, our forefathers believed that "the right to keep and bear arms" was important to maintaining freedom. Many groups today lobby to keep that constitutional guarantee, pointing out that the abolition of guns will *not* do away with crime. Crime and suicides remain high in countries that have rigid gun control laws. Only a fraction of one percent of the 100,000,000 or more estimated firearms owned by Americans ever are involved in accident or crime.

In this country, firearms serve useful purposes as collectors' items and for hunting, competition, recreation, and protection. State conservation departments depend on hunters to help maintain the delicate balance of nature and human needs. Hunting reduces surplus wildlife populations before they become so overpopulated they destroy farm crops and die from starvation. Wildlife management, of which regulated sport hunting is a vital part, has restored many species that have been depleted or threatened by habitat destruction, urban sprawl, agricultural practices, and market hunting.

The Missouri Department of Conservation promotes wise use of the outdoors by instructing people in how they can responsibly and ethically enjoy their state's natural resources. Department personnel have taken an active role in educating the citizens of the state in firearms safety.

Young people should grow up respecting, not fearing, firearms.

Young people should grow up respecting, not fearing, firearms. They should have the opportunity to enjoy their benefits, but they also should be taught from an early age how to handle a firearm safely.

Why Teach Firearms Safety?

Editor's Note: This information is aimed at instructors or leaders of firearms safety classes, but you are encouraged to share the information in this chapter with your students so they will understand the importance of learning firearms safety.

MANY YOUTH ARE INTERESTED IN FIREARMS

Many youngsters become intrigued with guns at an early age and their interest is reinforced by their environment. Television, movies, and books promote legendary heroes of the early west who rode tall in the saddle and shot from the hip. Westerns glamorize shoot-outs and "law by gun." The media also are saturated with modern-day violence. "Starsky and Hutch," "Charlie's Angels," and "Baretta" depict numerous assaults, murders, and robberies that are committed with a firearm. Toy guns, combat weapons, and space lasers line store shelves.

Without a more positive emphasis and proper instruction, children can grow up thinking that firearms are used only for violent crimes. They may completely avoid firearms because of an unrealistic fear; or they may treat firearms with a dangerous disrespect, using them only as toys for childhood games.

When youngsters are old enough to own a mimic of a real firearm, they are old enough to follow basic safety rules. When youngsters first become fascinated with firearms, it is time to begin instructing them in safety procedures. Many own a BB gun while still quite young; unfortunately, many treat it as a toy which has resulted in some children being injured. Youth often are entrusted with their first rifle during their early teen years, so they already should be familiar with the rules of safe gun handling.

YOUTH ARE APT TO ENCOUNTER FIREARMS

Firearms are kept in many American homes — for protection, for hunting or other sport purposes, or as collector's items. Youngsters may encounter a firearm while rummaging in their parents' closet, exploring old trunks in the attic, visiting friends or relatives, or babysitting at the neighbors.

If they know how to handle a firearm safely and properly, their sudden discovery should be no problem or threat. Youngsters who have been taught firearms safety should be able to protect themselves and others because they are able to recognize instantly when a firearm is being used or exhibited in an unsafe manner that may cause an accident.

KNOWLEDGE OF HOW TO HANDLE FIREARMS REDUCES ACCIDENTS

Accidents are caused by ignorance or carelessness on the part of people. A firearm is an inert object incapable of acting or thinking; it is only as dangerous as the person who uses it. Most firearms accidents easily could be prevented by knowing how the firearm operates and handling it carefully.

Deaths caused by firearms are small in number compared to total accidental deaths in the United States. The National Safety Council's 1978 edition of *Accident Facts* reports that in 1977 there were 2,000 deaths caused by firearms. That same year all accidental deaths totaled 104,000. Sixty percent of the 2,000 firearms-related deaths occurred in homes.

Accidental deaths caused by firearms (National Safety Council figures)

1973	*2,700*
1974	*2,513*
1975	*2,380*
1976	*2,059*
1977	*2,000*

In 1977 all accidental deaths totaled 104,000.

Accidental deaths caused by firearms have been declining. The National Safety Council reported that in 1973 there were 2,700 deaths; in 1974 there were 2,513; in 1975 there were 2,380; and in 1976 there were 2,059.

More people of all ages are receiving training in firearms safety and hunter education. In 1963 the National Rifle Association began a Home Firearm Safety Program from which has evolved its Home Firearms Responsibility Course. Currently, 8,498 instructors teach the course and 97,737 people have been trained in home firearms safety since the program began.

In Missouri, the Conservation Department has trained more than 300,000 people in hunter safety and education classes. Conservation agents and volunteer instructors throughout the state conduct firearms safety classes for school-age children. Training is available through the department's Outdoor Skills Education Unit for adults who want to become certified to teach firearms safety.

More education for young people is needed. Statistics show that accidents involving firearms are more frequent among people aged 15 to 24 (32 percent of 1976 firearms accidents), followed by those aged 5 to 14 (18 percent of 1976 firearms accidents). These age groups are involved in half of all firearms accidents and stand to benefit most from firearms safety courses.

THE SHOOTING SPORTS PROVIDE RECREATIONAL AND COMPETITIVE ENJOYMENT AND A VALUABLE HISTORY LESSON

A firearms safety course frequently sparks increased interest in the shooting sports as youngsters want to learn more about black powder, rifle, pistol, and shotgun shooting.

The shooting sports provide recreation and competition for both sexes. In no other competitive sports do men and women compete as equally, side by side, as they do in the shooting sports. Unfortunately, shooting sports events do not often receive media coverage. Few people know that American men and women have won 104 gold medals in Olympic shooting competition. This ranks third in total medals won behind men's rowing (137 gold medals) and

men's swimming (131 gold medals).

The Grand American Trap Tournament, held annually in Ohio, attracts more participants than any other single sporting event in the world.

Four times in the past 13 years, Missouri has hosted the International BB Gun Championships for youth 8 to 14 years of age. The annual event attracts young competitors from all 50 states, Canada, and Mexico. The championships are the culmination of a 10-week shooting education program, conducted by U.S. Jaycee chapters, that reaches more than 700,000 youngsters.

Numerous opportunities are available for boys and girls to compete in physical education classes, extra-curricular activities, clubs, or camps. The shooting sports are among the safest activities, which is born out by the fact that there has never been a fatality in the history of organized competitive shooting. How many other sports can make such a claim?

More emphasis will be given in other modules to the recreational value of teaching youths to shoot firearms.

One area that should not be overlooked is history. Those teaching firearms safety should not pass up the opportunity to impart a valuable history lesson to their students. The history of firearms and the role firearms played in the development of the United States is covered in chapter two.

The History of Firearms Development

Editor's Note: Instructors in the shooting sports too often pass over the history of firearms in their haste to get on with the practical aspects. The historical development of firearms is a fascinating tale of invention, survival, warfare, exploration, revolution, expansion, and recreation. The development of the United States can be told in the evolution of its firearms. Our heritage, after all, began with an unidentified shot on April 19, 1775 at the Battle of Lexington, a shot heard 'round the world. The author has compiled an annotated chronology of firearms development to encourage instructors to retell and discuss the history of firearms as part of their course in firearms safety. A crossword puzzle on the history of firearms is included as a student activity.

The abbreviation **c.** *designates an approximate date. Since spellings differ on some of the terms,* **The Firearms Encyclopedia,** *published by Outdoor Life, was used as the reference for the spelling of words.*

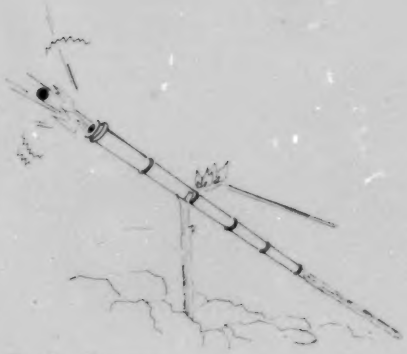
An Annotated Chronology of Firearms Development

As primitive man evolved, he perfected tools that helped him to sustain life. When he picked up a club to defend himself or fashioned a snare to catch food, he used a tool. In the beginning, tool-making was almost synonymous with weapon-making.

Early man was content to use weapons he operated by his own physical means until he invented an explosive powder that greatly increased his potential to hurl objects. A little powder, an object in a tube closed at one end, and a means of ignition created the first arm that could be "fired."

c. 1250

Although the Chinese had been using *gunpowder* for centuries, Roger Bacon, Franciscan friar, English philosopher, and scientist, received credit for publishing, and thus inventing, the recipe for gunpowder (black powder). Also credited with the discovery was Berthold Schwartz, a German monk and alchemist. This may have been the "brightest spot" in a dark period of history, the Middle Ages, especially when someone carelessly tossed in some fire!



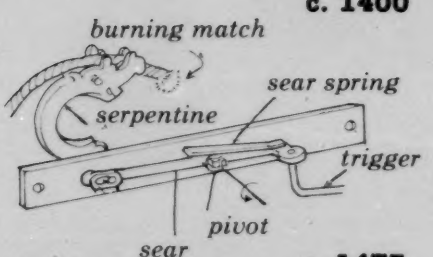
Early Cannon

Writings indicate that the English used a *cannon* at the Battle of Crecy. (The fight, however, was won by archers and longbows.) The Chinese had used the explosive powder in fireworks, but not until now had it been used as a weapon in warfare.

c. 1350

The first portable firearms were developed. The first *hand cannons* consisted of a barrel and a crude wooden handle. A touchhole was bored at the rear of the barrel through which a red-hot wire was inserted. Since hot coals were used to heat the wire, the shooter could not wander far from the fire. The primitive weapon became the first in a long line of mobile firearms.

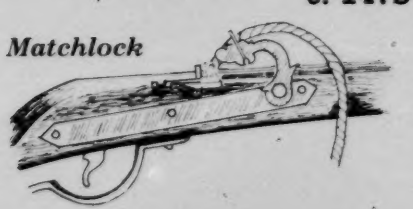
c. 1400



Early in the 15th century, a *match* made from a cord of flax, hemp, or cotton that was saturated with saltpeter or the dregs of wine replaced older methods of igniting the powder. Both ends of the match were lit and kept smoldering, allowing the shooter limited mobility.

c. 1475

Matchlock



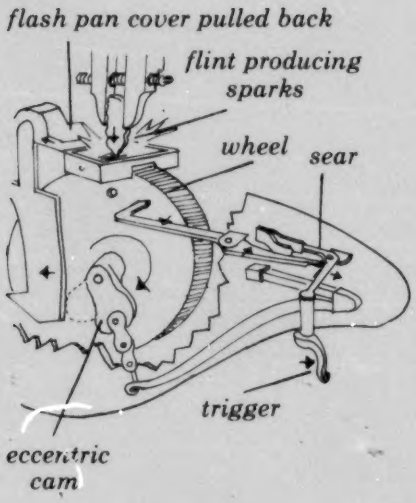
The inconvenience of trying to hold the firearm, aim it, and light it led to the invention of the *matchlock*. When fired, an S-shaped lever, called a *serpentine*, brought the smoldering match into contact with the priming powder in the pan. As it flashed through the flashhole into the chamber, the powder charge ignited and the gun fired. The lower end of the serpentine served as the first *trigger*. A spring was developed to provide tension on the cocked serpentine and a more sophisticated trigger was developed to release the serpentine. The matchlock was dangerous

because the fiery cord dangled around the unstable black powder. Successful firing of these guns required good weather, dry powder, and a stationary target. Still, it was the first firearm to use three essential parts of modern-day guns — *lock (or action), stock, and barrel.*

c. 1500

The matchlock was the weapon first used by Spanish explorers in the New World. The Spanish matchlock, called an *harquebus* (arquebus), weighed 30-50 pounds and was steadied on a forked stick. Some required two men to operate them. The harquebus, because it was slow and had a maximum range of only 100 yards, was no match for the faster, more accurate bow and arrow. Yet the "thunder sticks" with their noise and fire terrified and intimidated the New World Indians.

Wheellock



Historians differ on the exact origin of the *wheellock,* some crediting German gunmakers, and others saying it was developed in Hungary or Italy. The wheellock did away with the problems of the smoldering match. It operated much like a modern-day cigarette lighter — a serrated steel wheel was wound by a key on a clock-like mechanism. When the trigger was depressed, the wheel spun against the iron pyrite (flint) as it unwound. This dropped a shower of sparks into the flashpan. The advantage of the wheellock was that it could be carried loaded and primed for instant use; however, it was a complex, fragile, and expensive adaptation and only the European aristocracy could afford to use it.

The first *rifling,* or grooves, in barrels was straight and designed to collect black powder residue and thus make loading easier. Spiral rifling first was tried on the wheellock harquebus in an attempt to spin the bullet and give it greater accuracy.

The *snaphance* (snaphaunce), the father of the flintlock, was equipped with a curved steel hammer-like vise that held a piece of flint. When the trigger was pulled, the flint fell against the battery to create sparks which in turn fell into the flashpan. Developed in Scandinavia and Holland, it was the first lock in which the cock moved.

c.1550

Black powder often lacked uniformity in chemical composition and physical texture. Besides being dangerous to handle, it burned with varying degrees of explosiveness. Manufacturers during this time learned that by moistening the mixture and making it into a cake, it could be forced through screens and broken into uniform pieces. This allowed the rate of burning to be controlled. Granulated or *"corned"* powder was the first major improvement in gunpowder.

About this same time, the Spanish developed the *musket* for their foot soldiers. Designed to pierce armor, it

quickly was adopted by most European armies. The term later came to mean a smoothbore muzzle-loader that used multiple projectiles, a forerunner of modern shotguns.

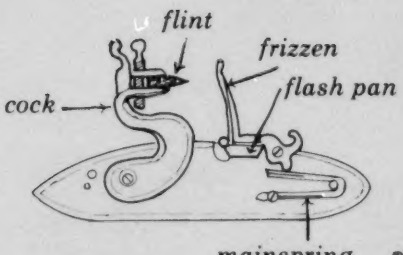
By the end of the 16th century, the gun was held to the shoulder and fired using a trigger, a method that has changed little.

c. 1600

The *miquelet* lock, developed in Spain and Italy, was probably the first gun lock in which the frizzen and priming pan cover were combined into a single part. The miquelet, a form of flintlock, was also unique because its mainspring was attached to the outside of the lockplate.

c. 1610

The *flintlock* was developed in France. It was an improvement over the snaphance because its flashpan cover was part of the battery instead of separate. Rather than being pushed out of place manually, it was moved automatically by the blow of the flint on the battery. The device was rugged, trouble-free, and relatively inexpensive. The flintlock ignition system was so popular that it lasted for more than two centuries.



Flintlock

The 17th century also saw the sport of shooting flying birds gain popularity. The earliest known "birding piece" was a snaphance smoothbore dated 1614 that belonged to King Charles I of England.

c. 1620

Frontiersman with Kentucky Rifle

Early settlers in America used firearms they brought with them. They gradually began to adapt the European versions to the needs of the frontier.

The first truly American rifle, the *Kentucky rifle,* was made by German and Swiss immigrants living in Pennsylvania. It was named after the frontier where it was used, not after the place where it was made. The flintlock muzzle-loader (affectionately called "Old Betsy") had a small bore and used a rifled barrel that was three and a half to five feet in length. The stock usually extended to the muzzle and was made of maple or fruitwood. With this firearm the American frontiersman could "shoot the eye out of the wind." The Kentucky rifle had a role in the American Revolution, and at the Battle of New Orleans (1815) both the Kentucky rifle and Andrew Jackson triumphed.

Another American innovation was used with the Kentucky rifle. Smaller bullets were loaded more easily by

the use of a patch of linen or buckskin lubricated with saliva ("chewin the rag") or grease. The new method of loading also increased accuracy.

1798

Sometimes overlooked, Eli Whitney, the cotton gin genius, conceived the idea of interchangeable gun parts. *Mass production* allowed the manufacture and, more important, the repair of firearms that a common man could afford to buy.

c. 1800

The long-barreled Kentucky rifle used by frontiersmen such as Daniel Boone and Davy Crockett was too long, light, and easily broken for the "mountain men" who moved west across the plains and into the mountains. These explorers needed a short-barreled rifle with a steel lock, stout stock, and large bore. Although not considered a major step in the development of firearms, the *plains rifle,* of which the St. Louis-built Hawken was the most famous, filled an important need.

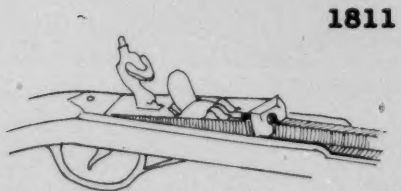
The English gunsmith Joseph Manton started crafting *double-barreled* shotguns, which were direct descendants of the smoothbore musket. Sporting arms were becoming popular in England and a few wealthy Americans returned from abroad with shotguns that cost as much as $350.

Mountain man with Hawken Rifle

1807

A Scottish clergyman, Alexander Forsyth, invented and patented a priming powder composed of potassium chlorate and fulminate of mercury. It worked well but was expensive and required precise manufacture.

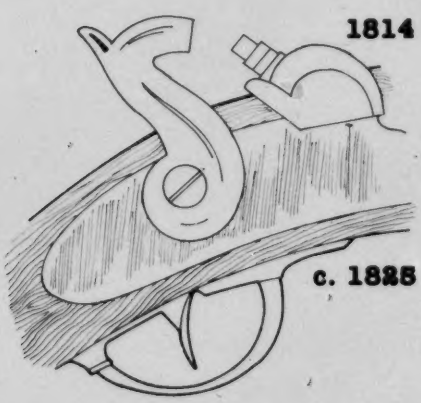
1811



Open Breech Loader

Although *breech loaders* (firearms loaded at the rear of the barrel) had been used by the British as early as 1776 in the Revolutionary War, defects in design made them impractical. John H. Hall patented the first practical breech loader in 1811. The U.S. Army at first discounted the firearm because rapid fire gave soldiers the chance to waste ammunition, but in 1819 the Army commissioned the manufacture of 1,000 breech loaders.

1814



Caplock

The development of the *percussion cap* quickly followed the Forsyth invention. The most notable cap was devised by Philadelphia artist Joshua Shaw. The copper cap fitted over the nipple in the breech and when struck by the hammer created an instantaneous flash. The system greatly improved the flintlock and made repeating weapons finally practical.

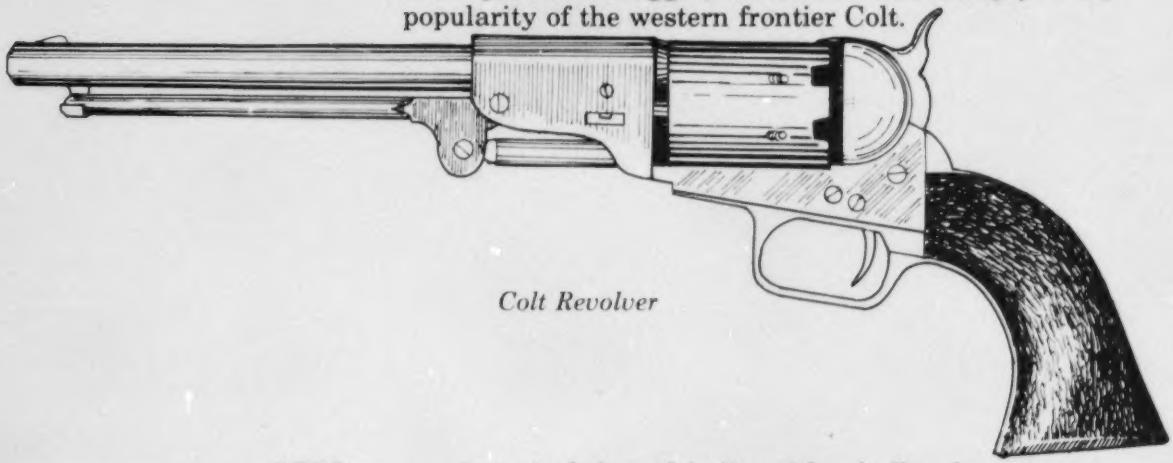
c. 1825

By the first quarter of the 19th century, *caplocks* were being manufactured instead of flintlocks and many locks were altered to use the new, more dependable method of ignition.

1835

Samuel Colt perfected the first *revolver* (handgun with a rotating cylinder). Powder and ball were tamped into

each of six chambers and the powder was ignited by percussion caps fired by *single action* (cock the hammer and squeeze the trigger). No other sidearm enjoyed the popularity of the western frontier Colt.



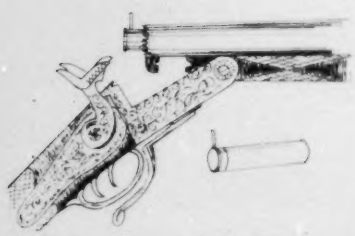
Colt Revolver

1836 A conical-shaped *bullet* with a hollow base was invented, then improved, by the Frenchman C. E. Minie. The hollow base expanded when fired, forcing the bullet to grip the rifling. Since a patch was no longer necessary, loading time was decreased. The "Minie bullet" is still used today by black powder buffs.

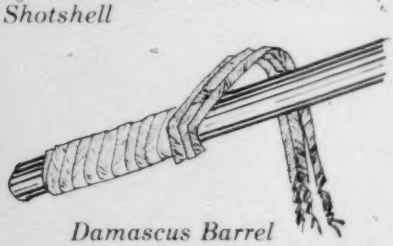
Minie Bullet

1848 Christian Sharps patented a stronger and safer breech loader that incorporated a sliding breech block held in a heavy metal frame. The firearm used cartridges with paper or linen cases that were sheared when the breech block closed. The exposed powder was ignited when the hammer hit the percussion cap. It was simple, rapid, and effective. A skilled shooter could get off 10 shots a minute. Hunters welcomed the Sharps, and by 1860 over 30,000 were being manufactured yearly. More than 80,000 Sharps carbines and rifles were used in the Civil War.

c. 1880 A highly controversial debate was going on about this time concerning the invention of a French gunsmith, Casimir Lefaucheux. Lefaucheux made the direct ancestor of today's double-barrel shotgun. His gun, with its hinge (break-open) action at the rear of the barrel, used a *pinfire shotshell.* Some sportsmen were reluctant to give up their muzzle-loaders even though double-barrel muzzle-loading shotguns were dangerous to load (the loader always ran the risk of one barrel accidentally discharging while he was loading the other barrel from the shooting end). With the new breech loader, the shooter merely half-cocked both hammers, opened the breech, dropped in two cartridges, closed the breech, and fired. Time and trial testing would prove the firearm to be a revelation.

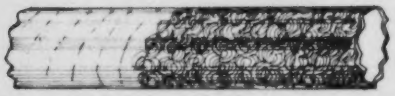


Breech Loader and Pinfire Shotshell



Damascus Barrel

At this same time, *damascus barrels,* manufactured since the mid-1700s, were becoming a popular design for premium shotguns. The barrels were made of iron and steel rods twisted together, wrapped around a mandrel, and



hammer welded. They were easily recognized by their distinctive whorl patterns. The process was used well into the early 1900s, but increased pressure of smokeless powder and modern techniques of drilling solid steel made damascus barrels unsafe and antiquated.

1858 Americans dreamed of a *repeater rifle* that would be even faster than the single-shot breech loaders. Samuel Colt produced one of the first by modifying his popular revolving pistol. He attached a shoulder stock and lengthened the barrel to devise a revolving cylinder repeating rifle. It never gained popularity because it lacked accuracy and was dangerous to hold while firing.

1859 Although the first *rimfire cartridge* was developed in 1845 by the Frenchman Flobert, the first complete *metallic cartridge* was introduced by Smith and Wesson in 1859. The soft copper case with its rimfire (around the rim) primer, powder, and bullet lacked the strength to be used with high-powered, heavy charges, but it still was a giant step forward. An effective repeating firearm depended on the invention of the metallic cartridge.

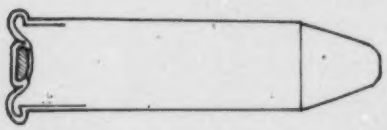
1860 Two American repeating *lever action* rifles were invented that became popular — the Spencer and the Henry (later the Henry was renamed the Winchester Repeating Rifle). The Spencer rifle and carbine was the first effective *magazine* repeater. A tube magazine located in the butt of the gun held seven cartridges which were fed automatically into the chamber by a lever. The Henry's magazine, located under the barrel, held 15 cartridges.

During the Civil War, Union cavalrymen who were lucky enough to have Spencers could fire 15 shots per minute. Southern troops referred to the Henry as "the Yankee rifle that can be loaded on Sunday and fired all week."

Also at this time, shotgun choke was developed both in America and in England.

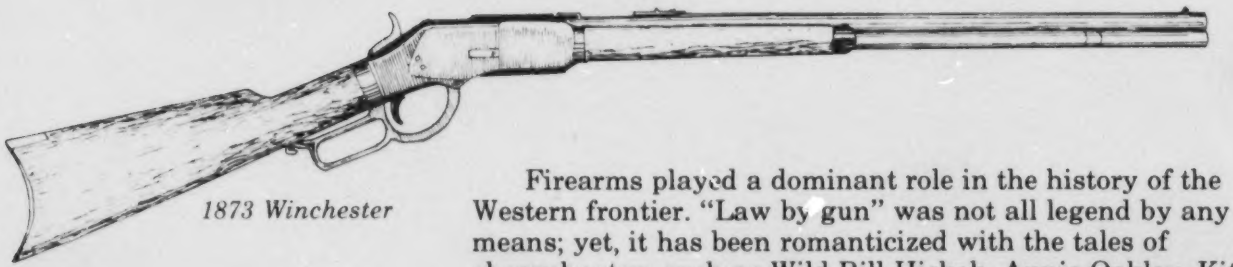
1869 When Colonel Henry Berdan developed a method of drawing brass into a seamles tube, the modern metallic cartridge evolved.

c. 1870 Berdan and Marcellus Hartley of the Union Metallic Cartridge Company joined forces to devise the *centerfire cartridge*, a more powerful cartridge in a stronger brass case with the priming mixture in the center instead of the rim.



1870-1900 While repeating firearms of every conceivable action were perfected, the Winchester Arms Company continued to improve upon the Henry. Just as Colt became synonymous with "revolver," the Winchester meant "rifle" to many people.

The 1873 model of the Winchester was the first chambered for the centerfire metallic cartridge. It gained considerable favor as "the gun that won the West."

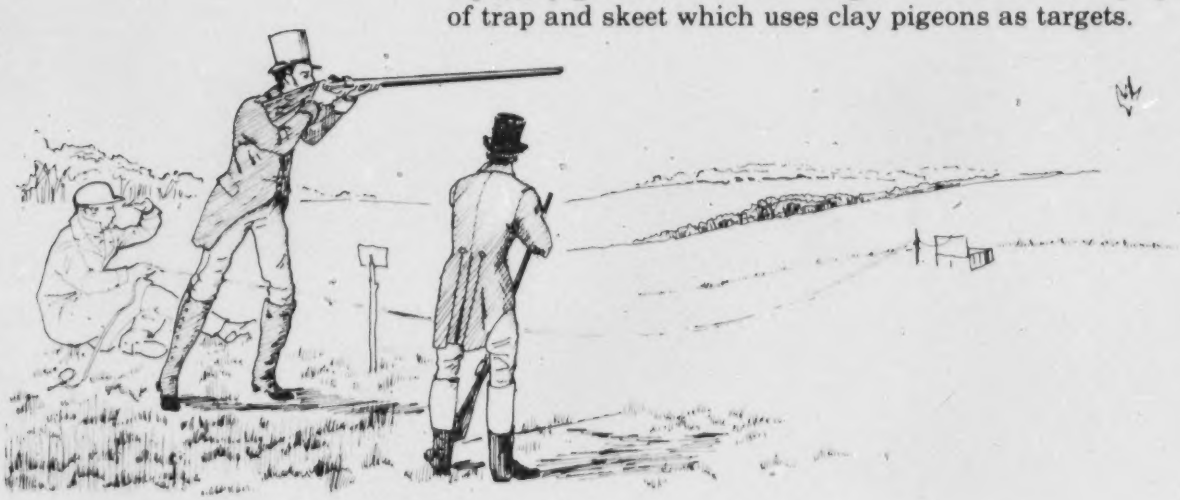


1873 Winchester

Firearms played a dominant role in the history of the Western frontier. "Law by gun" was not all legend by any means; yet, it has been romanticized with the tales of sharpshooters such as Wild Bill Hickok, Annie Oakley, Kit Carson, "Buffalo Bill" Cody, the Earps, and Bat Masterson. Firearms were important during this time in history because law enforcement was not established in many areas and families, still struggling for food, protection, and survival, depended on their firearms.

1875

Trapshooting with live passenger pigeons was a popular sport until Captain Adam H. Bogardus, well-known market hunter and champion trapshooter, was arrested in St. Louis for the activity. The city's Society for the Prevention of Cruelty to Animals objected to the absence of "fair chase" and public opinion turned against the event. Small glass balls were thrown as targets to replace pigeons and set the stage for the modern-day sport of trap and skeet which uses clay pigeons as targets.



Trapshooting with live pigeons

c. 1885

Since the Middle Ages, the same basic recipe of charcoal, saltpeter, and sulphur had composed gunpowder. It soon became the limiting factor in firearms development for it burned so fast that gas pressures were reduced before the bullet left the muzzle. Powder residue also corroded the metal and after firing, a smoky cloud obscured vision or gave away the shooter's position.

A French chemist named Vieille made a *smokeless powder* by placing guncotton (cotton treated with nitric

and sulfuric acids) in a mixture of alcohol and ether. The paste was rolled into sheets, dried, and cut into small squares. The first American smokelss powder was cylindrical, dried grains made using the same basic technique.

1894 The first American firearm to use the new powder, the Winchester Model 1894 lever action, has become without a doubt the most famous rifle of all times. With its improved nickel-steel barrel, it used the immortal .30-30 centerfire, smokeless cartridge. Today the model is still manufactured and is in constant demand.

1900— While the 20th century has seen vast changes in the weapons of warfare, the basic sporting firearms and their methods of propelling a projectile toward a target have remained essentially the same. Nevertheless, some refinements and design changes have occurred. Barrels of high-velocity rifles and steel-shooting shotguns are now lined with harder metal alloys; many semi-automatic rifle and shotgun actions are gas-operated; and a few sporting gun designs use stocks and working parts of synthetic materials.

American shooters, however, tend to be a conservative lot, and they still favor blued steel, walnut stocks, and conventional design.

How to Identify and Operate Firearms

Editor's Note: Knowledge of firearms safety should begin with a thorough understanding of the types of firearms, their parts, and how they operate. Whenever possible, students should be allowed to see and handle actual firearms. While charts and diagrams are effective teaching tools, they cannot replace the value of handling a real firearm. Strict safety procedures must be followed, and the instructor always should be present when firearms are displayed. ***Extreme caution should be taken always to point the muzzle in a safe direction and to keep the action open.***

What is a firearm?

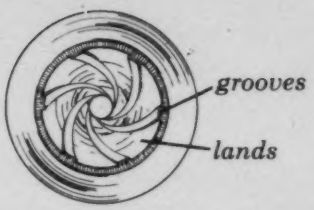
"Firearm" is a more accurate and preferred term to use than "gun" or "weapon." A firearm is an instrument that fires a projectile using an explosive charge as a propellant. In most sporting arms, a rapidly burning type of gunpowder is used. Modern-day firearms are "fired" when a cartridge is put into the chamber and the firing pin strikes and explodes the primer which in turn ignites the powder. The burning powder creates a gas that expands and forces the bullet or shot out the barrel.

Air guns, which use springs, compressed air, or carbon dioxide gas to propel the projectile, are commonly used by beginning shooters. The inexpensive BB gun propels .17 caliber solid steel projectiles with fair accuracy and relatively low power although severe eye injury is possible at close ranges. Other air rifles with a more sophisticated design use rifled barrels to propel inexpensive lead pellets of .177 or .22 caliber, and they have a consistently greater match accuracy than any match grade .22s or centerfires.

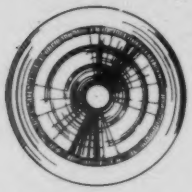
When the compressed spring air rifle is fired, tension is released and a plunger forces a column of air supporting the BB out the muzzle. Velocity, and thus the power of this air rifle, remains the same for each shot. The pump-up air rifle uses a pneumatic pump to compress air in a reservoir; the more it is pumped, the greater the compression and thus the velocity of the pellet when it's fired. All of the accumulated air is expended each time the rifle is fired. The CO_2 rifle uses commercial compressed gas cartridges that release a metered amount of pressure from the small steel container into the bore. It operates much like the pneumatic and fires 30 to 60 shots before the cartridge must be replaced.

Types of firearms

The three basic and distinct types of modern firearms are rifles, shotguns, and handguns. Rifles and shotguns sometimes are referred to as shoulder firearms or long arms. Handguns may be called pistols, (derived from the northern Italy town of Pistoia where they originated), revolvers, short arms, or side arms.



Rifle Barrel (with rifling)



Shotgun Barrel (smoothbore)

RIFLE

A rifle has a wood, plastic, or wire stock which is fitted to the shoulder and a relatively thick and heavy barrel. The primary distinction between a rifle and a shotgun is the *rifling,* or spiral grooves, in the barrel of the rifle. Almost always there is a metal or telescopic sight mounted on or over the barrel of a rifle.

SHOTGUN

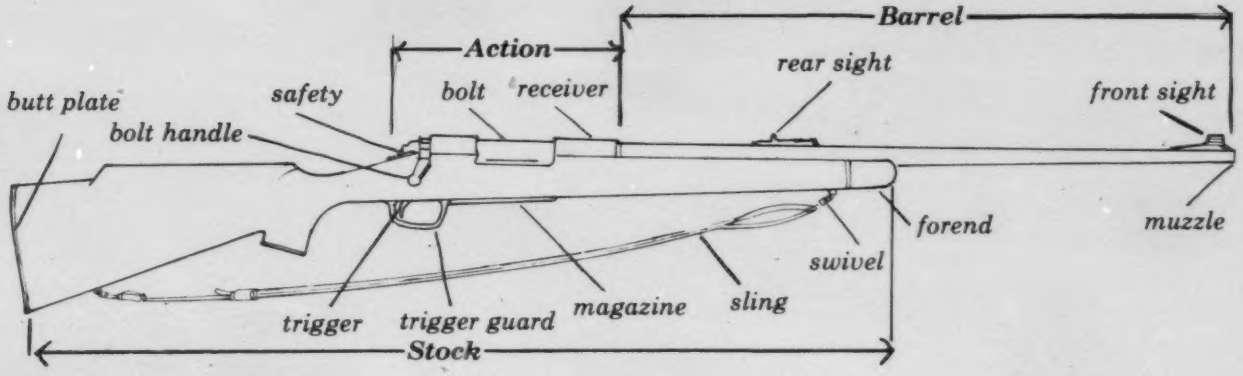
Although a shotgun resembles a rifle, its barrel is thin-walled and smooth and resembles a piece of steel tubing. Shotguns usually fire small round shot or pellets.

HANDGUN

A handgun is a short firearm that can be held and fired with either one or two hands. Like a rifle, it has rifling in its barrel and fires bullets.

Parts of firearms

All firearms have three essential parts known as action, stock, and barrel. To be able to handle a firearm safely and skillfully, it is important to know the names of the parts and how they work. Most firearms are basically the same and the names of their parts also are very much alike.



Actions

Note: Action should be ***open*** *and* ***unloaded*** *when handling a firearm with students! The functioning part should be removed. Read the manufacturer's recommendations.*

The action is the mechanism that makes the firearm operate. It contains the moving parts which load, fire, and eject the used cartridge case. Most actions are either single shot or repeating styles. While the single shot is loaded manually, the repeater has cartridges held in a ready position by a magazine. The cartridges are chambered as the action is operated, and spent cartridges are ejected.

Firearms usually are distinguished and named by their particular action design. The five basic actions are bolt, lever, pump, hinge, and semi-automatic. Some handguns have a revolving cylinder (hence the name "revolver") into which cartridges are loaded.

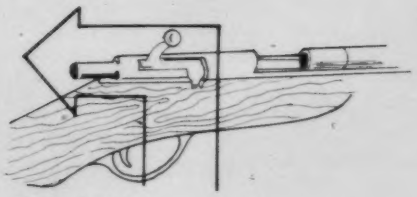
True automatics or "machine guns" like those seen in movies portraying gangsters of the 1920s and '30s are

illegal for private ownership. Only specially licensed collectors, the military, and certain police agencies may possess them.

For beginners, the safest firearms are those with actions that hold only a single cartridge or shell. The firearm is loaded by hand, one shell at a time, which prevents a round of ammunition from being unknowingly or accidentally chambered, which can happen in repeater firearms if a round is lodged in the magazine. A new shooter also does not lose track of how many shells or cartridges have been fired. The shooter can easily check to see that the firearm is empty and no ammunition has been caught in the chamber. The most common rifle of this kind is the bolt action. Shotguns of this kind are most frequently hinge action. Repeating firearms include the bolt, lever, pump, and semi-automatic actions.

BOLT ACTION SHOULDER FIREARMS

A bolt action rifle operates much like an old-fashioned door bolt and is one of the strongest and simplest actions to operate. To open the action, lift the bolt handle up and pull it all the way back. If the firearm is loaded, the cartridge should be extracted when the bolt is pulled back. To make sure, however, examine the open action. When the bolt is open, the rifle cannot fire. Bolt action firearms that are repeaters will have a magazine that feeds additional rounds into the action. The magazine should be checked and emptied when handling the firearm. You can make sure any bolt action rifle is safe by removing the bolt and storing it separately.



Bolt Action

LEVER ACTION SHOULDER FIREARMS

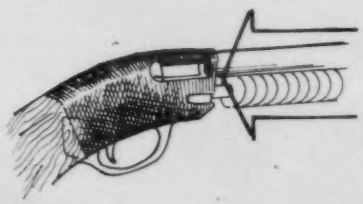
Lever action rifles, frequently seen in Western movies and television shows, are still manufactured today. The action works by pulling the elongated trigger guard, or lever, downward away from the stock which moves cartridges from the magazine into the chamber for firing. When you pick up a lever action rifle, flip the lever down and away from you, opening the action so the firearm cannot be fired. It is more difficult to determine if these firearms are loaded because the action is more complicated. To make sure the magazine is empty, operate the lever action until no more cartridges are ejected. Then with the action open, look into the chamber and magazine.

Lever Action

PUMP ACTION SHOULDER FIREARMS

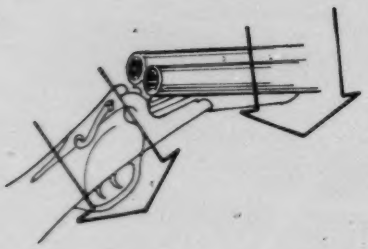
A pump action rifle or shotgun also may be called a slide or trombone action because the wooden forend is pumped back and forth to operate the action.

To open the action, pull the forend back toward the trigger guard. If the gun is cocked, loaded or not, a release must be pressed before the pump will operate. The release usually is located just in front of or just behind the trigger



Pump Action

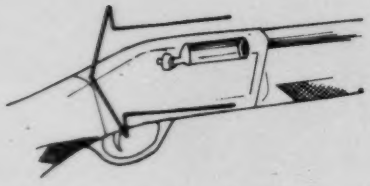
guard. When the action is open, examine it to make sure it isn't loaded; also check the magazine to make sure it is unloaded.



Hinge Action

HINGE ACTION SHOULDER FIREARMS

Hinged or break-open shotguns are the safest for readily determining whether or not a firearm is loaded. The hinge on a hinge action firearm operates like the hinge on a door. To open the action, push the release lever atop the firearm to the side which allows the action to break open and extract cartridges. The open action reveals at a quick glance whether the firearm is loaded or empty. Hinge action firearms have no magazine.



Semi-Automatic Action

SEMI-AUTOMATIC SHOULDER FIREARMS

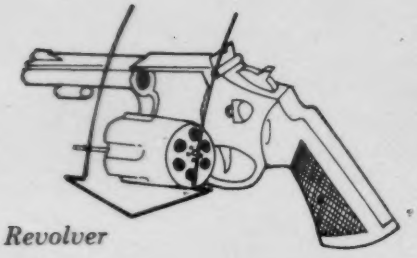
Semi-automatic rifles and shotguns sometimes are incorrectly called "automatics;" instead, they are auto-loaders. Fully automatic firearms continue to fire as long as the trigger is depressed and there is ammunition. With semi-automatic actions, the trigger must be pulled to fire each shot.

The action is opened by pulling back the handle. Some semi-automatics will lock open when the handle is pulled all the way back, but others must be held open to see if they are unloaded. While the action is open, locate the magazine and check to be sure it is unloaded. With those models that lock open, be careful not to accidentally trip the release that springs the handle shut.

Semi-Automatic

SEMI-AUTOMATIC HANDGUNS

This action operates much the same way as the semi-automatic rifle and shotgun. The magazine is located in the handgun's grip and is released by pushing a button. To open the action, grasp both sides of the slide with one hand and pull it back. Check to make sure no cartridges are in the chamber. If the slide will not lock open with the magazine removed, empty the magazine and replace it in the firearm so the slide will lock open.



Revolver

REVOLVER HANDGUNS

The magazine of a revolver is a cylinder that revolves as the firearm hammer is cocked or the trigger pulled. The cylinder contains chambers, usually six, although the number may vary from five to nine. Cartridges are loaded, one in each chamber, and are ready to fire as the cylinder rotates, aligning each loaded chamber in turn with the barrel.

Revolver actions open differently depending on the make and model of the firearm and cylinders may rotate in different directions. On some, the cylinder swings out from the frame; other revolvers break open either up or down on a pivot. In both of these the complete cylinder is exposed and it is easy to see if it is loaded. Another type of revolver has a cylinder that doesn't swing out or break open, but is

loaded through a loading gate on the side. The hammer must be pulled back slowly to "half cock" position. This can be determined by the first click which is heard as the hammer is drawn back. (This may not apply to some recent single-action revolvers.) This frees the cylinder to rotate. If cartridges are in the cylinder, they can be pushed out using the ejector rod located alongside or under the barrel.

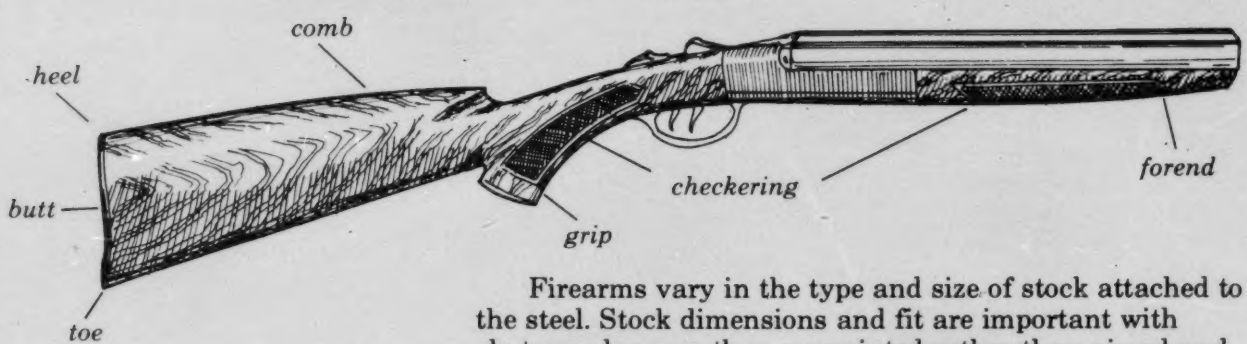
Revolvers are manufactured in single-action models and others capable of both single-action and double-action firing.

With a single-action revolver, the hammer must be pulled back or cocked before each shot. The trigger then can be pulled with only three to five pounds of pressure. On a double-action revolver, pulling the trigger cocks the hammer, rotates the cylinder, and fires the gun all at the same time. But as much as 8 to 12 pounds of pressure are required to pull the trigger. The heavier the trigger pull, the harder it is to deliver a well-placed shot.

While revolver and semi-automatic are the most common actions, some handguns are made with hinge and bolt actions.

Stocks

The stock is the "handle" of the firearm. It is necessary to position the mechanical part of a firearm so that maximum accuracy can be obtained in a comfortable manner. In the handgun, the stock is the part of the frame that includes the grip.



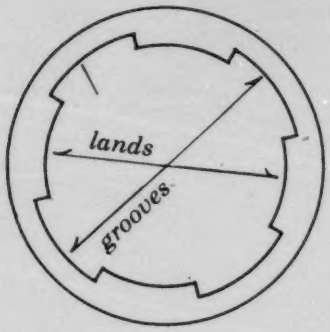
Firearms vary in the type and size of stock attached to the steel. Stock dimensions and fit are important with shotguns because they are pointed rather than aimed and shooting is done very quickly. The stock must fit so the shooter's eye is positioned correctly over the barrel.

Many less expensive modern firearms use hardwood stocks. Most firearm owners prefer a stock of heartwood American walnut which is more durable and attractive. Today quality imported firearms use one of the European walnuts.

Checkering, or diamond-shaped grooves cut by hand or by machine in the stock, decorates the firearm and helps keep hands from slipping when handling the stock. Most gun buffs consider good quality checkering and fine burl wood stocks a cosmetic factor to compliment the quality firearm.

Barrels

The end of the barrel, or the muzzle, always should be pointed in a safe direction. To emphasize this with students, place a strip of fluorescent orange or red tape around the muzzle.



The barrel is the metal tube through which the projectile passes when the firearm is fired. The hole through the barrel is called the *bore.* Rifle and handgun barrels differ significantly from shotgun barrels — they have thicker walls and contain spiral grooves in the bore called *rifling.* The ridges of metal left between the grooves are called *lands.* First used in the Kentucky rifle, rifling causes the bullet to spin or spiral like a football, making it more stable and giving it greater accuracy and range. The grooves can be seen by looking down the barrel of any rifle or handgun.

Shotgun barrels, on the other hand, are relatively thin because the ammunition used in shotguns develops much less pressure. They often are called "smoothbores" because the inside surface is smooth.

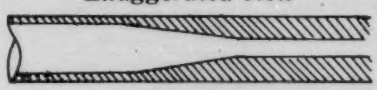
Shotguns fire large numbers of small shot in a dispersed pattern. To control the spread of the shot after it leaves the barrel, shotguns are constricted, or *choked,* about one and a half inches from the end of the barrel. A choke is to a shotgun what a nozzle is to a garden hose; it determines at what distance the shotgun will be most effective. Choke designs vary depending on the manufacturer and the method used. From the tightest to the most open, the common chokes are *full, modified, and cylinder,* which means no choke. Variations of these are used depending upon the type of shooting done; for instance, some trap shooters prefer an improved modified choke.

The *caliber* of rifles and handguns normally is determined by measuring the diameter of the bore before the rifling has been cut, or the distance between opposing lands after it has been cut. Caliber generally is expressed in hundredths or thousandths of an inch, and sometimes in millimeters. A .22 caliber measures 22/100 of an inch between lands. In some cases the caliber is actually the groove or bullet diameter.

With one exception, shotguns are classified by *gauge* instead of caliber. Gauge is determined by the number of lead balls, each measuring the diameter of the bore, it would take to weigh one pound. For example, find a lead ball that is the same diameter of a 20-gauge shotgun barrel and it will take 20 of those balls to make one pound. The larger the gauge number, the smaller the bore diameter. The exception is the .410 bore which is actually the width of the bore measured in thousandths of an inch. The .410, therefore, is really a caliber rather than a gauge. Modern shotgun gauges, starting with the largest, are 10, 12, 16, 20, 28, and .410.

Chokes

Exaggerated view

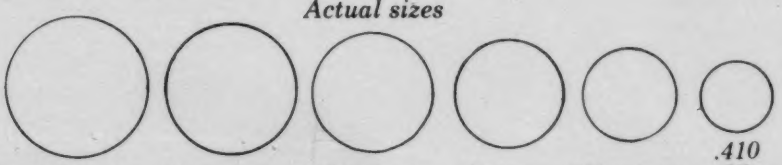


Full choke is the most constricted and keeps the shot close together.

Modified choke is less constricted than full.

Cylinder choke means there is no constriction in the barrel and the shot spreads quickly as soon as it leaves the barrel.

Actual sizes

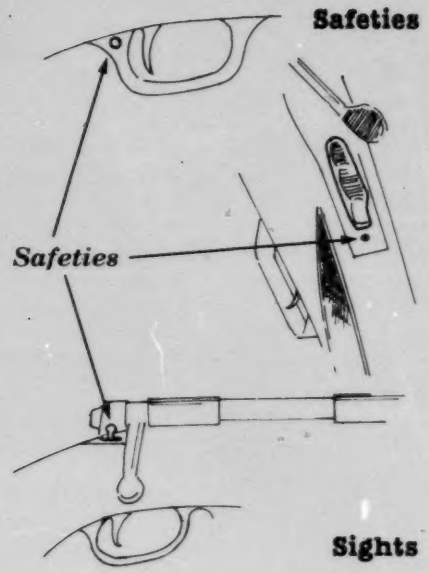


The larger the gauge number, the smaller the barrel.

Trigger

The trigger is the part of the action moved by the finger to fire a gun. Safety needs to be emphasized regarding the trigger on all firearms. Caution students to keep their hands and fingers away from the trigger until they actually are ready to fire the firearm.

Safeties



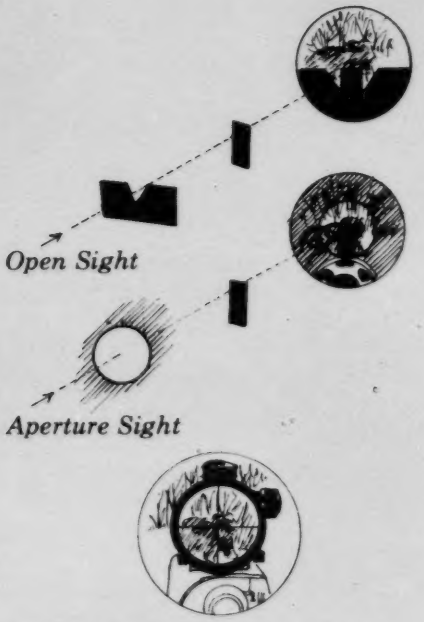
The safety blocks the action or trigger of the firearm so the gun cannot be fired when the safety is in the "on" position. It is located on the firearm so the trigger hand may operate it quickly and easily.

When a firearms safety is "on," the gun supposedly cannot fire. The safety, however, is meant only to supplement proper firearms handling and should not be relied upon to prevent accidental firing. Always remember that safeties are mechanical devices and may fail to work. Firearms with the safety on have been known to fire when dropped or struck against another object. (Perhaps a better name for the safety would be an O.F.R.O.S. or Only-Fools-Rely-On-Safeties.)

When students are handling firearms, the safety should always be on. It should be left on and released only immediately before firing.

Sights

The sights on firearms are devices for guiding the eye in aiming the gun. They are important additions to rifles and handguns because they help shooters to be more accurate. Rifle sights are classified as open, aperture (peep), or telescopic. Handguns normally have open sights, but scoped pistols and revolvers are becoming more popular.



Telescopic Sight

OPEN SIGHTS

Open sights are the most common, the simplest in construction, and usually the least expensive. Although they can be adjusted, the methods generally are crude. A proper sight picture using an open sight is shown here.

APERTURE (PEEP) SIGHTS

The aperture sight on rifles offers greater accuracy and the capability of making finer and more controlled adjustments. A proper sight picture is shown at the left.

TELESCOPIC SIGHTS

Telescopic sights are the most advanced and accurate for shooting at targets or game that are far away. The shooter simply looks through the scope and sets the cross hairs, post, or dot on the target and fires. Telescopic sights also provide magnification which makes the target appear closer, and they gather light making it easier to identify the target. Most scopes enlarge the image from two times (2X) for brush shooting up to 20 times (20X) for target shooting.

SHOTGUN SIGHTS

Sights are not nearly so important to a shotgun shooter who does not aim but rather "looks" down the barrel at the target, keeping both eyes open. The shooter uses the shotgun to "point" and follow a moving object.

Usually shotguns have a single round bead on the top of the barrel near the muzzle to help direct vision. Some shotguns have a second smaller bead about halfway back on the barrel to aid proper alignment. Ventilated ribs (for heat wave dispersion) on top of the barrel also can be used as a sight plane. When a shotgun is used like a rifle, open or scope sights sometimes are used.

Ammunition

Editor's Note: Instructors should use only dummy ammunition if there are firearms also in the classroom. Live ammunition should only be used if firearms are not present at the same time.

Without ammunition, a firearm is merely a piece of wood and metal. Although it may be decorative hanging above the fireplace, it has little function until it is loaded.

The discovery of gunpowder, one of the essential components of ammunition, can be traced to the Chinese. Roger Bacon, however, is usually given credit for its discovery because he was the first to publicize the recipe. The basic black powder concoction of charcoal, sulphur, and saltpeter remained relatively unchanged from the 1200s to almost 1900.

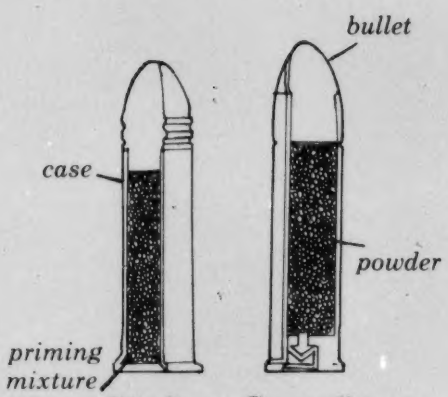
Black powder had its drawbacks. Bullet velocity was never great because the powder burned at an instantaneous rate and gas pressure decreased rapidly. The billowy puff of smoke gave away soldiers' concealment and hunters couldn't tell if they had hit their mark. The residue from the powder also fouled barrels and eroded the metal parts of firearms.

A new smokeless powder was the result of experimentation with guncotton and nitroglycerin. Today, there are many types of smokeless powders of various compositions, each specialized for its task. The basic difference is in the burning rate and the amount of gas produced. Handguns, with their short barrels, need a powder that burns quickly at low pressures. High-powered rifles need a slower burning powder that builds pressure to give the bullet increased force as it leaves the barrel.

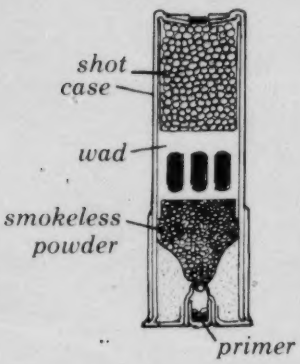
Self-contained cartridges originated about the time of the Civil War and quickly replaced separately loaded powder and shot ignited by a percussion cap. The cartridge was handy because it brought together all the ammunition components into one form that was easy to handle and load.

Basic components of ammunition

All present-day ammunition has at least four basic components.



Rimfire Cartridge *Centerfire Cartridge*



Shotgun Shell

CASE

The case is the brass, steel, copper, paper, or plastic cylinder into which all other components are assembled.

PRIMER

The primer contains a chemical mixture which explodes when struck by the firing pin. The violent flame of the primer explosion serves as a "match" to ignite the powder charge.

In all modern ammunition except the rimfire cartridge, the primer is separate and located in the center of the base of the cartridge. These are called *centerfire* cartridges or shells. In the *rimfire* cartridge the primer compound is distributed in a ring around the inner edge of the metal casing at the base of the cartridge.

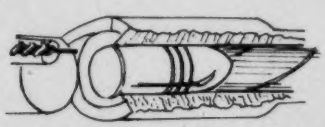
POWDER CHARGE

When ignited, the powder charge produces great quantities of gas which propel the bullet or shot charge through the barrel.

BULLET OR SHOT CHARGE

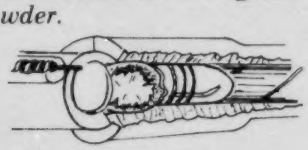
In rifle and handgun ammunition, the final component is a lead or metal-jacketed projectile called a *bullet.* In shotgun ammunition, the *shot charge* is a number of lead or steel shot pellets. Shot pellets are available in various sizes. Shotgun slugs are made of lead and are used for hunting deer and other large game with a shotgun. In a shotgun cartridge, a wad is used to separate the powder and shot charges and to prevent the gas from escaping through the loose shot as it travels out the barrel.

How ammunition fires

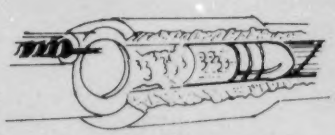


Cartridge is in chamber.

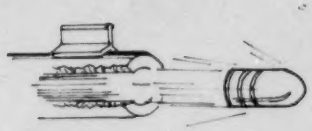
Firing pin strikes and explodes primer which in turn ignites powder.



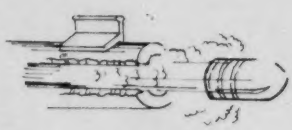
Gas from burning powder expands in case.



Gas pushes bullet out with force.



Bullet leaves barrel.



Bullet and escaping gases produce a "bang."

Types of ammunition

CARTRIDGES

There is no general rule that governs the common designations of American metallic cartridges. While Europeans have followed a fairly strict system of identifying cartridges by metrical designations, the American system is really no system at all. Calibers are generally measured in hundredths or thousandths of an inch and may be expressed either as bore or groove diameter. For example, bore diameter is used to identify the .30 caliber class of cartridges, but all of them fire bullets measuring .308 of an inch, which is the actual groove diameter. Others are designated by groove diameter, such as the .243, .257, and .264.

Some cartridge names have multiple parts which have various meanings. The famous .30/06 is so named because it is a .30 caliber cartridge first developed in 1906. The .250/3000 indicates a certain .25 caliber cartridge that produced a muzzle velocity of 3000 feet per second. The .22/250 indicates a cartridge originally made from a .250/3000 case necked down to fire a .22 bullet. The list goes on.

American handgun cartridges follow the same pattern, or lack of it. The .357 magnum cartridge is named from the groove diameter of the barrel. What we call a .38 isn't a true .38 caliber at all, neither in bore nor groove diameter. In reality, .38 and .357 bullets and barrels are exactly the same diameter.

When handling firearms, be absolutely certain that your ammunition and firearm are intended for each other, since cartridges with similar names may not be at all similar. The only way to understand American cartridges is to learn each one individually. Don't depend on the system because there isn't one.

SHOTGUN SHELLS

Shotshells generally are much larger than metallic cartridges. Shotgun shell size is measured by gauge (the number of lead balls the diameter of the bore which would weigh one pound). Commonly used shotshells are 10, 12, 16, 20, and 28 gauge. The 12-gauge shell is the most common today.

As with most everything, there is an exception to the rule. The .410 shotgun gauge is a caliber, not a gauge, and the gun used for this shell is equivalent to .41 caliber. It is the smallest of all shotguns manufactured and sold in the United States today.

Shotgun shells generally are made of plastic with metal reinforcement at the base. Plastic has become more popular than paper because it resists swelling from moisture and extends the reloading life of the shell.

Reloading ammunition

Reloading shells and cartridges has become popular and will save money; however, no reloading should be done without proper instruction and equipment. The reloader's

handbook instructions should be followed exactly. It's not always wise to trust someone else's reload unless you trust the reloader.

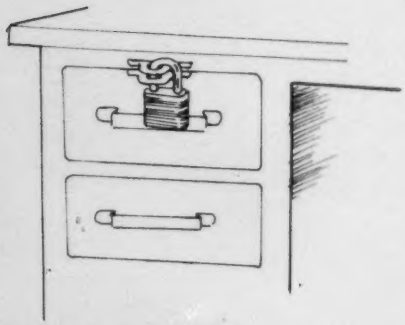
Selecting ammunition

Warning! Be sure to match the proper ammunition to the firearm you are using.

The wrong shell or cartridge used in a firearm can cause gun damage or personal injury. If the ammunition seems too loose or tight it should not be used. Shotguns and rifles have their gauge or caliber marked on the barrel. Many shotgun shells are color-coded to help with identification. Color-coding is not universal, however, so it should not be relied upon.

Ammunition also should be selected according to its intended use. If the ammunition is being used for hunting, the hunter should know what is available, its range and effectiveness, and its normal or intended use. This will be covered in more detail in the Hunter Education module.

Storing ammunition



Lock all ammunition.

All ammunition should be locked up, preferably in a separate area away from where firearms are stored. The key should be kept in a separate, hidden location.

Black powder is highly volatile and special precautions need to be taken with its handling and storage. The smallest spark can ignite the unstable powder. Never smoke around black powder (or any other powder) and keep it away from any fire. Store it in a cool, dry area away from any heat or possible flames.

All ammunition, in fact, should be kept away from fire or heat sources. No ammunition should be left out where it can be handled unsupervised by inexperienced people.

Principles of Firearms Safety

Ten Commandments of Firearms Safety

The National Rifle Association has developed a list of basic rules that should be followed when handling firearms.

1 Always point the muzzle in a safe direction. Be able to control the direction of the muzzle even if you should stumble.

2 Treat every firearm as though it were loaded.

3 Unload firearms when they are not in use. Keep the action open when the firearm is stored and carry it in a case to the shooting area.

4 Be sure the barrel and action are clear of obstruction and that you have the proper ammunition for the firearms you are carrying.

5 Be sure of your target before you pull the trigger.

6 Never point a firearm at anything you do not want to shoot. Avoid all horseplay with a firearm.

7 Never climb a fence, tree, or jump a ditch with a loaded firearm. Never pull a firearm toward you by the muzzle.

8 Never shoot a bullet at a flat, hard surface or water.

9 Store firearms and ammunition separately.

10 Avoid alcohol and other drugs before or during shooting.

Primary rules

All firearms accidents could be avoided by knowing and observing the simple safety principles of holding and pointing a firearm. Instructors should not, however, turn a safety lesson into a memory lesson of the Ten Commandments. Students need to understand, practice, and accept the reasons for safety rules. Three primary rules are most important and should be stressed throughout the instruction.

1. Always point the muzzle in a safe direction.

A "safe direction" means in a direction that should the firearm discharge it will not cause injury or damage. Inside a building a firearm should *not* be pointed at a window, floor, ceiling, interior wall, or any other surface which the bullet might penetrate and hurt someone on the other side. Instead, firearms should be pointed at exterior walls.

Not only will safety-conscientious firearm handlers not

point the muzzle of a firearm at another person, they will not allow a gun to be pointed at them. Students of firearms safety should know and recognize when a firearm is not being handled safely. It is their responsibility to inform others.

2. Make sure the firearm is unloaded before handling it.

Safe firearm handlers check every firearm by opening the action and looking and feeling inside the breech or chamber to make certain the firearm is not loaded. They *never* take another person's word for safety, but assume the responsibility themselves. "I didn't know it was loaded" is never an acceptable excuse.

3. Always treat the firearm as though it were loaded.

This is a good basic rule of thumb to avoid the accidents that may happen because of mechanical or human error. By always following this rule firearm users are prepared for anything.

Safety in the home

The majority of accidental firearm deaths occur in the home.

In the home is where youth are most apt to come across a firearm. Three out of every four households nationwide are estimated to possess one or more firearms. In 1977 accidents in the home comprised 60 percent of all accidental firearm deaths; therefore, how firearms are stored, cleaned, and handled in the home needs to be evaluated by every family.

Safety in the home should begin by locking up all firearms and storing ammunition in a separate location, also locked. Drawers, closets, under beds, or in corners are not safe places to leave guns. Nor should ammunition be left within reach. In northwest Missouri a youngster was killed when he forced a .45 caliber pistol cartridge into a toy dart gun and pulled the trigger.

Firearms kept as collector's items can be a special hazard. The old "frontloaders" with flint or caplock actions usually were stored loaded so chances are they may still have the powder and patched ball rammed tight. A spark from a match, the fireplace, or even a toy cap gun could cause such guns to fire. It's a good idea to have them checked by an experienced gunsmith. Treasured relics and war-time souvenirs should be displayed out of reach or kept locked with other firearms.

The home is the most likely location for firearms cleaning accidents. Immediately after being used, firearms should be cleaned, disassembled, and stored under lock. In normal shooting situations only occasional cleaning of the barrel is necessary. Firearms should be given a thorough cleaning inside and out when they have been exposed to mud, sand, rain, or snow; moisture has formed on metal parts (such as when a firearm is brought into a warm room

Cleaning Supplies

from the cold); or the gun has been stored uncovered and exposed to the air for a long time. Salty fingerprints left on a firearm work as an acid and can corrode the metal.

Cleaning equipment should include a cleaning rod, flannel patches, powder solvent, and light gun oil. A cleaning cloth treated with silicone also is advisable. Always check to be sure that the gun is empty, and make certain that no ammunition is nearby.

As a safety precaution, and for the protection of the barrel, a firearm should be cleaned from the breech end (rear of the barrel) whenever possible. Too much oil or grease can be dangerous; a few drops will do in most cases. Grease should never be used in the barrel unless the gun is being prepared for a long period of storage. Too much oil on safeties can make them ineffective.

When handling firearms in the home, all safety precautions should be reviewed and stressed. The classroom or any other teaching location should serve as a positive example. Firearms and ammunition should never be in the same room. Only dummy ammunition that has been fired or had the primer and powder removed should be used. Youngsters who are taught to properly handle firearms at school or elsewhere often times carry the lessons home to their parents.

Safety in the field

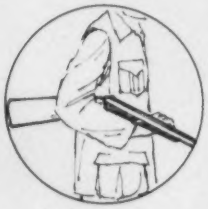
Safety in the field will be covered in more detail in the Hunter Education module. Some information is needed in a firearms safety course, however, because youngsters may go afield to plink tin cans as well as to hunt. When youth participate in organized shooting sports, they have well-defined rules to follow. When they go afield, however, they are more on their own and it is especially important that they know how to handle a firearm for they may not have adult supervision.

Two-Hand Carry

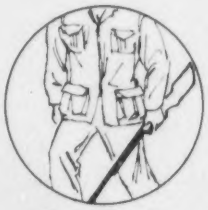
Young shooters need to learn how to carry firearms when they go out in the field. Although there are several ways to carry firearms, the safest is probably the two-hand carry which gives the best control of the gun and the muzzle. With this carry the small of the stock is gripped with the trigger hand and the forend with the other hand. The gun is carried diagonally across the body with the muzzle pointed up and away. Other carries are the cradle carry, the shoulder carry, the side carry, the trail carry, and the sling carry. Handguns should be carried in some type of holster.

Cradle Carry

Shoulder Carry



Side Carry



Trail Carry

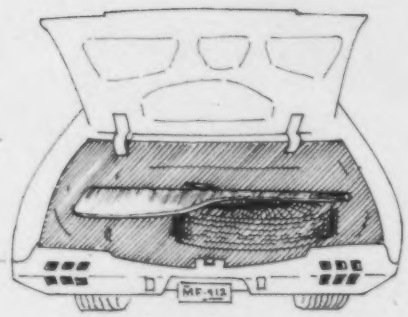
Sling Carry

In all carries, the following rules always apply:

1. Keep the muzzle under control and pointed away from all people, animals, and yourself.
2. Keep the safety "on" until ready to fire.
3. Keep fingers outside the trigger guard and not on the trigger. Fingers should only touch the trigger when firing. Covering the trigger guard with the hand will help prevent other objects from hitting the trigger.

When target practice is the sport of the day, all firearms should be left unloaded until shooters are ready to fire at the targets. Placement of targets is also important. Make sure that nothing behind the targets can be injured or damaged or cause bullets to ricochet.

Safety in transport



Transport firearms in a case in the trunk.

Young shooters need to understand that they are responsible for the safety of their firearms *at all times.* The task is not difficult if the primary rules of safe firearm handling always are observed.

A firearm should be unloaded before it is put into a vehicle, and it always should be left unloaded while transporting it. The best means of transporting a firearm in a vehicle is to keep it unloaded, inside a case, and in the trunk. This keeps it safe and out of sight.

Loaded guns should never be taken into a tent or cabin. When going to a range or practice area, firearms should be transported unloaded. On all ranges, firearms must be unloaded and should be taken to and from the firing line with actions open.

Firearms should not be leaned against automobiles, trees, fences, or other insecure rests whether loaded or unloaded. Firearms that are taken care of properly are not only safer, but they also last longer and need fewer repairs.

Lesson Plans

The following lesson plans are offered as a suggested and field-tested means of teaching this subject material. Activities provided have been taught by teachers, Department of Conservation education specialists and consultants, and youth leaders.

Times are estimated for 50-minute class periods; however, the time needed for each lesson may vary depending upon the teacher and class. Instructional aids listed in the lesson plans are available from the Department of Conservation. Pages marked as student handouts in the appendix may be reproduced without permission.

ADAPTABILITY TO THE DEVELOPMENTALLY DISABLED

Activities in this module should be suitable for all your students with few adaptations needed for those developmentally disabled. Some of your students may have shot a firearm and they should be encouraged to discuss their experiences if they have. If they have not used a firearm, they should be encouraged to try handling one. The Department of Conservation has successfully conducted shooting skills programs with disabled individuals. Suggestions for adaptations will be covered more specifically in other shooting skills modules.

No. 1

TITLE: Introduction

METHODS: Lecture, class discussion, film

TIME: Two 50-minute periods

PURPOSE: To introduce content material and objectives of firearms safety; to determine the potential for contact with firearms in home, school, and work; and to discuss the importance of developing proper firearms safety knowledge and attitude.

INSTRUCTIONAL AIDS: "Sweet Sunday's Gone" 16 mm film, projector, screen, chalkboard or easel with paper

FACILITIES: Classroom that can be darkened for film

OUTLINE: (Lecture)

I. Introduction
   - A. A knowledge of firearms and their proper handling reduces accidents.
   - B. A knowledge of firearms and how to handle them properly helps develop a respect for them as useful tools with legitimate functions.
   - C. Use of firearms is a controversial subject with proponents and opponents taking strong emotional stands.
   - D. People, not guns, commit crimes.
     1. The right "to keep and bear arms" is a

Constitutional guarantee of every law-abiding citizen of the United States.

2. Only a fraction of a percent of the 100,000,000 or more estimated firearms owned by Americans are ever involved in an accident or crime.

E. Firearms serve many legitimate functions.
   1. Hunting and harvest of surplus wildlife.
   2. Collecting as valuable works of art and/or antiques.
   3. Competitive shooting skills.
   4. Recreational enjoyment.
   5. Protection of property and life.

(Class Exercise)

II. Why should I know firearms safety?

A. Assign students to small groups of four to six, depending on class size.

Materials needed: blackboard, or easel and large sheets of paper

B. Request the groups to compile a list of reasons why or circumstances when they might need to know how to *safely* handle a firearm (not necessarily shoot it).

C. Have a volunteer recorder write each list on the chalkboard or easel paper for easy visual comparison by class members.

D. Discuss what has been decided upon by the class. What are some of the potential dangers if people do *not* know-how to handle firearms safely?

(Film)

III. "Sweet Sunday's Gone" (20 minutes)

A. This is an emotionally powerful film and students should be prepared for the strong emotional impact of the simulated firearms accident and the medical care that follows.

B. Students should be asked to be aware of the following while watching the film:
   1. Rules of firearms safety that were ignored.
   2. Father's instructions to his son.
   3. Statements made by the firearms safety instructor.

C. When the film is over, the preceding three questions should be used as the basis for a positive discussion pointing out the violations of firearms safety rules and common sense.

(Lecture)

IV. Facts about firearms

A. A firearm is an inert object incapable of acting or thinking.

B. Firearm deaths in the United States are small compared to total accidental fatalities.
   1. In 1977, of 104,000 accidental deaths, only 2,000 were caused by use of firearms.
   2. Partially as a result of increased firearms safety education efforts, the accident rate continues to decline.

C. Firearms safety instruction is most needed for

younger, inexperienced youth.

1. About 32 percent of firearm accidents involve those aged 15-24.
2. About 18 percent of firearm accidents involve those aged 5-14.

D. Firearms safety knowledge helps promote interest in recreational shooting sports activities.

1. A total of 104 Olympic gold medals have been won by the U.S. in shooting competition, ranking it as the third most winning sport.
2. The annual Grand American Trap Tournament has the greatest number of participants of any single sporting event in the world.
3. U.S. Jaycee chapters work with more than 700,000 youngsters who compete in BB gun championships that culminate in an annual International BB Gun Championship Meet.

No. 2

TITLE: History of Firearms Development

METHODS: History can be taught in a number of ways: lecture (physical education teachers can team-teach with history teachers); individual homework assignments (the chronology and crossword puzzle can be reproduced and distributed); extra-credit or research projects for individuals or groups.

TIME: 50 minutes (more or less depending on how instructor teaches the history)

PURPOSE: To emphasize the importance of the firearm as a tool in the historical development of the United States and Missouri and to convey some of the more significant dates, names, and developments in firearms history.

INSTRUCTIONAL AIDS: "History of Firearms' Actions" (Appendix 1), Chronology of Firearms Development (pages 17-24), "History of Firearms Crossword Puzzle" (Appendix 2).

FACILITIES: Classroom

OUTLINE:

(Lecture)

I. Introduction

A. The historical development of firearms is a fascinating tale of invention, survival, warfare, exploration, revolution, expansion, and recreation.

B. The development of the United States and Missouri can be told in the evolution of its firearms.

(Class Exercise)

II. History of firearms

A. The instructor should prepare the class to work the crossword puzzle by lecturing on firearms history,

giving the class a reproduced copy of the annotated chronology, or assigning students to research and present a history lesson to the class.

B. The crossword puzzle should be distributed. Class time may be used or students may take it home to complete.

C. If time permits and the instructor would like to initiate a class discussion, or ask students to do additional research, some of the following questions may be posed.
   1. Why did the first firearms limit mobility?
   2. How did each succeeding firearm action — matchlock, wheellock, flintlock, caplock — make the firearm better? (Refer to drawings in Appendix 1)
   3. Why is the Kentucky Rifle a misnamed firearm?
   4. If necessity is the mother of invention, why was the Hawken plains rifle invented and manufactured, especially around St. Louis?
   5. How did the percussion cap allow the invention of a repeating firearm?
   6. Why do the names Winchester and Colt stand out as immortal in the lore of the American West?
   7. Why did the British during the Revolutionary War dub the New World a "Nation of Riflemen"?
   8. Why did our forefathers ensure every law-abiding citizen of the United States the right "to keep and bear arms" in the Second Amendment to the United States Constitution?

No. 3

TITLE: How to identify and safely operate the parts of a firearm

METHODS: Lecture, slide presentation, demonstration

TIME: 50 minutes

PURPOSE: To teach students the parts of a firearm and how to safely operate all parts.

INSTRUCTIONAL AIDS: "Parts of a Firearm" (Appendix 3), slide series on parts of firearms, 35 mm projector and screen, demonstration firearms with various actions

FACILITIES: Classroom

OUTLINE:

(Lecture)

I. Types of firearms (use demonstration firearms if available)

   A. A firearm is an instrument that fires a projectile using an explosive charge as a propellant.

Even though the Principles of Safety section follows, it is impossible to teach firearms nomenclature without verbally inserting safety rules and demonstrating them. When using demonstration firearms, make sure that no live ammunition is in the classroom and remove the functional part of actions whenever possible to insure absolute safety.

B. Three basic types of firearms are commonly used.
   1. A rifle has a shoulder stock and fires a single projectile through a barrel that has rifled grooves cut in it.
   2. A shotgun has a shoulder stock and fires multiple projectiles dispersed through a smooth bore.
   3. A handgun is held in one or both hands and fires a single projectile through a short, rifled barrel.

(Slide Presentation)

II. Firearms nomenclature (See Appendix 3)
   A. A firearm is made up of three parts: action, stock, and barrel.
   B. Rifles and shotguns exist in five basic *actions*.
      1. Bolt action
      2. Lever action
      3. Pump (slide or trombone) action
      4. Hinge action
      5. Semi-automatic action
   C. Handguns are mostly found in two types of actions, but others also are available.
      1. Semi-automatic
      2. Revolver
         a. Single action
         b. Double action
      3. Break-open, bolt action, and other unusual handgun actions.
   D. The *stock* is the "handle" of the firearm.
   E. The *barrel* is a metal tube through which the projectile is fired.
      1. Rifle barrels are thicker with grooves and lands called rifling.
      2. Shotgun barrels are thinner and do not contain grooves and are sometimes called "smoothbores."
      3. Rifle calibers are determined by bore diameter.
      4. Shotgun gauges are determined by the archaic measurement of the number of lead balls the diameter of the barrel that would weigh a pound.
   F. Knowledge of the other basic parts of a firearm are necessary for safety.
      1. The *trigger* is a crescent-shaped metal extension below the action that when depressed releases the firing pin and "fires" the cartridge.
      2. The *safety* is a mechanical device that blocks firing of the firearm when the trigger is touched.
         a. It is not a fail-safe device but rather a mechanical gadget and thus capable of malfunction.
         b. Only Fools Rely On Safeties (O.F.R.O.S.)
      3. *Sights* aid shooters in hitting their target.
         a. Rifles and handguns have open, aperture, or

telescopic sights.
b. Shotguns have a sight plane.

III. Review

Handle firearms in the safest manner. Practice what you preach!

A. The instructor should use real firearms that are representative of each action to illustrate and review the major parts of the firearm. Be sure to demonstrate how to open each action.
B. To reinforce what students have learned, allow them to handle the firearms and practice opening the actions, but *only* after stressing these safety rules:
1. No ammunition should be present.
2. Check that firearms are unloaded.
3. Make sure muzzle is pointed away from people.

No. 4

TITLE: Ammunition Identification and Safety

METHODS: Review, lecture, demonstration, slide presentation

TIME: 50 minutes

PURPOSE: To teach students the various components of ammunition, types of ammunition, and safety factors relating to ammunition.

INSTRUCTIONAL AIDS: "Ammunition Components" (Appendix 4), slide series on ammunition, 35 mm projector and screen, hot plate and small skillet or grill, wooden matches, small samples of various types of smokeless powder and black powder

FACILITIES: Classroom that can be darkened for slides

OUTLINE:

I. Review
Review firearms parts.

(Slide Presentation)

II. Ammunition components (See Appendix 4)
A. Case — brass, brass (steel) and paper, or plastic.
B. Primer — the spark plug of the cartridge.
C. Powder charge.
D. Wads (not found in single-projectile rifle or handgun cartridges).
E. Bullet or shot pellets.

*If demonstration firearms are in the classroom, do **not** use live ammunition in this day's program. Use only dummy or fired rounds.*

(Demonstration)

III. How ammunition burns
This demonstration illustrates the relative safety of modern smokeless powder cartridges, when not confined in a pressure chamber of a firearm, in comparison to the relative danger of unstable black powder in storage.
A. Place a sample of different types of powder for

Materials needed: hot plate and small skillet or grill, wooden matches, small samples of various types of smokeless powder and black powder.

The instructor should wear safety glasses and a protective laboratory apron. Any students standing near the demonstration also should wear protective clothing.

rifle, pistol, and shotgun on the preheated hot plate grill.
B. Record the results. Discuss.
C. Pour small quantities of each powder one at a time on the cooled metal pan. Ignite each with a match.
D. Point out how modern powders burn slower compared to the black powder which burns quickly and violently.
E. Discuss the results.

(Lecture)

IV. Facts on ammunition
A. Types of ammunition
1. Single projectile cartridges used in rifles and handguns.
a. Define caliber.
b. Give common calibers.
2. Shotshells or slugs used in shotguns.
a. Define gauge.
b. Give common gauges.
B. Reloading of ammunition
1. Can save money.
2. Should follow instructions carefully.
3. Should be wary of other people's reloads.
C. Selection of ammunition
1. Ammunition should be matched to the firearm.
2. Not matching ammunition can cause damage to the firearm and injury to the shooter.
D. Storage of ammunition
1. Ammunition should be kept separate from firearms.
2. Ammunition should be stored under lock and key.
3. Special precautions need to be taken with black powder.

V. Homework Assignment
In preparation for tomorrow's lesson on firearms safety, have students write down the Ten Commandments of Firearms Safety. Ask them to pick the commandment they think is the most important and write a paragraph supporting their choice.

No. 5

TITLE: Firearms Safety

METHOD: Discussion, class exercise

TIME: 50 minutes

PURPOSE: To teach the principles of firearms safety and how to handle firearms safely in the home, in the field, or while transporting them in a vehicle.

INSTRUCTIONAL AIDS: Demonstration firearms with different actions, "Home Firearms Check List" (Appendix 5)

FACILITIES: Classroom with blackboard, gymnasium, or outdoors

OUTLINE:

(Class Discussion)

I. Firearms Safety
- A. List the Ten Commandments of Firearms Safety on the blackboard.
- B. Ask students to name which commandment they picked as being the most important.
- C. Select some students to read why they made the choice they did.
- D. Discuss the choices that have been made.
- E. Discuss the three primary rules.
  1. Always point muzzle in a safe direction.
  2. Open the action and make sure the firearm is unloaded before handling it.
  3. Always treat the firearm as though it were loaded.

(Class Exercise)

II. Handling Firearms
- A. Ask for a student volunteer.
- B. Using an unloaded firearm, demonstrate how to safely hand the firearm to another person.
- C. Using the student as a model, show how to hold a firearm for a two-hand carry, and then for a cradle, shoulder, side, trail, and sling carry.
- D. Discuss why a two-hand carry is considered safer in many situations.
- E. Have other students line up first in front, then behind, then beside the student holding the firearm. Discuss which carries would work in each case, keeping in mind that the muzzle must be pointed in a safe direction.
- F. Have students practice different carries.
- G. Discuss safe handling procedure for other situations.
  1. In the home.
     - a. Firearms and ammunition should be stored separately.
     - b. Antique firearms should be checked by a gunsmith to make sure they are not loaded and then displayed out of reach.
     - c. Cleaning of firearms should be done only by someone who is knowledgeable about firearms and knows proper safety procedures for handling guns.
  2. In vehicles.
     - a. Firearms should be transported unloaded.
     - b. Firearms should be transported enclosed in a case.
     - c. Firearms should be transported in a locked trunk or storage compartment.

Materials needed: demonstration firearms

III. Homework Assignment
Reproduce and distribute the Home Firearms Check List (Appendix 5) to students. Ask them to complete the check list and bring it to class the next day.

No. 6

TITLE: Firearms Safety Review and Evaluation

METHOD: Discussion, written and practical examination

TIME: 50 minutes

PURPOSE: To have students check firearms in their own homes; to review objectives of course; to reinforce principles of safe firearms handling; to answer questions students may have; to evaluate students' knowledge of firearms parts, ammunition, and safety procedures.

INSTRUCTIONAL AIDS: "Home Firearms Check List" (Appendix 5), demonstration firearms, written and practical evaluation (Appendix 7)

FACILITIES: Classroom

OUTLINE:

I. Home Firearms Check List
- A. Ask students to report on their findings with the check list. How many have firearms in their homes? Are the firearms safe?
- B. Discuss the check list and what the students found out.

II. Review
Using firearms, review course material.

(Class Discussion)

III. What Would You Do?
Encourage students to discuss what they would do in the following situations:
- A. A student is rummaging in a parent's closet and finds a gun in the corner of the closet.
- B. A student is babysitting and a youngster toddles out carrying a handgun.
- C. A student is visiting with the next-door neighbor when the 12-year-old youth takes down the firearm hanging above the fireplace to show it off.
- D. A student is hunting with companions who are not careful where they point their firearms.
- E. A student is riding in a car with friends who pull out a handgun and decide to shoot at passing road signs.

IV. Written and Practical Evaluation
Students' lives may someday depend upon their present training and how well they have learned the objectives

of this course. Students should be able to demonstrate how to properly handle a firearm and pass a written examination such as the one included with this material (Appendix 7).

Related Activities

Editor's Note: The following activities are suggested as supplements to a firearms safety program. They may be used individually or combined to extend a course.

Shooting Demonstration

Many youth, although they may listen intently to lessons on firearms, do not realize fully their potential danger until they witness firsthand the power of firearms. Shooting demonstrations can be set up by an instructor who has had experience with firearms or by an inexperienced instructor with the help of the local police department or conservation agent. Some police departments have indoor and outdoor ranges with facilities for such demonstrations. Many conservation areas also have outdoor range facilities. These agencies, when given enough notice, usually welcome the opportunity to help teach firearms safety to young Missourians.

Shooting demonstrations should impress, but not overwhelm, students. Small bore .22 caliber firearms can be fired safely into city telephone books or clear, soft pine boards taped together and the bullets later recovered to examine their impact. Even the "low-powered" .22 rimfire long rifle cartridge will course six to eight inches of pine. This usually impresses neophyte firearms safety students.

A five-gallon can such as those found around schools containing industrial floor wax or cleaner can be filled with water and used to show the effects of hydrostatic shock. When a centerfire rifle bullet hits the water-filled can, the shocking power of the bullet is transferred to the fluid and the can rips apart in all directions. Extreme caution should be taken to prevent anyone from being hit by flying metal.

Shotgun power also should be demonstrated because shotguns are used for hunting small game in Missouri and are involved in more accidents than other firearms. At close range, the power of the shotgun combined with the massive number of pellets it projects make it extremely dangerous. Shot patterns can be demonstrated by drawing 30-inch circles on large sheets of paper. Hang the sheets on wooden frames. From 40 yards away shoot shotguns with different chokes at each target; then count the percentage of pellets in the circle for each choke pattern. Another method is to have students shoot at a blank sheet of paper, then draw a 30-inch circle around the best concentration of shot.

Throughout the demonstration, make sure shooters and spectators abide by safety rules. Be sure to have

available safety glasses and ear protection for those who participate and insist they wear them.

Shooting Activity

A firearms safety course does not need to develop the fundamentals of actual shooting, but shooting as a concluding part of the course can reinforce the safety rules taught. At this time students should be feeling more confidence in understanding firearms and more security in handling them. They also should be keenly interested and curious if they have never before shot a gun.

Air rifles are recommended for this shooting activity because they can be easily set up in a school gymnasium or yard with minimal equipment. Air rifles, either BB or pellet guns, can be acquired on loan or purchased relatively inexpensively from manufacturers. The Outdoor Skills Education Unit of the Department of Conservation also lends equipment for shooting programs.

If an instructor is not experienced with firearms but wants to offer a shooting activity, help is available from the Department of Conservation by contacting the local conservation agent. Instructors themselves can receive training in shooting skills from Conservation Department Outdoor Skills Education Specialists who conduct teacher training workshops (see names and addresses on last page).

A shooting activity should provide an enjoyable, successful experience for students. It is an opportunity for them to apply firsthand their knowledge of safe handling of firearms and ammunition. More information on shooting skills is available in other modules in this series. Information on training programs and equipment can be obtained by contacting the Department of Conservation, Outdoor Skills Education, P.O. Box 180, Jefferson City, MO 65102. Additional information is available from the National Rifle Association, 1600 Rhode Island Ave., N.W., Washington, D.C. 20036; and the Daisy Company, Rogers, AR 72756.

Word Game

Appendix Six is a student handout entitled "A Word Game Using Firearms Phrases." Its suggested use is as an extra-credit assignment to reinforce students' awareness of the role firearms have played in the development of this country and to impress upon them how many expressions commonly used today are derived from firearms and their use.

Glossary

ACTION	The "working mechanism" of a firearm that loads, fires, ejects, and reloads a cartridge.
AUTOMATIC	A firearm that continuously chambers, fires, and ejects as long as the trigger is depressed.
BARREL	The metal tube, usually steel, through which the projectile passes.
BLACK POWDER	A basic mixture of the three ingredients of sulphur, charcoal, and saltpeter, it is the oldest small-arm ammunition propellant and was used predominantly until the invention of smokeless powder.
BOLT	In a bolt action firearm, it is the steel rod that contains the firing pin and ejector assemblies and is moved back and forth to hold the cartridge properly in the chamber.
BORE	The hole in the barrel through which the shot or bullet passes.
BREECH	The rear of the barrel where the chamber is located and into which the cartridge or ball and charge is seated.
BREECH LOADER	A firearm loaded at the breech end instead of the muzzle.
BULLET	The part of the cartridge, usually made of lead and sometimes covered or jacketed with metal, that becomes the projectile when the gun is fired.
CALIBER	The diameter of a rifled barrel measured from land to land in fractions of an inch. It also designates the ammunition that the firearm shoots.
CARBINE	A category usually used to describe a short rifle; originally it described a short military rifle.
CARTRIDGE	A tube of metal, paper, or both, containing primer, powder, and bullet for rifles and handguns and primer, powder, wads, and pellets for shotguns.
CENTERFIRE	A cartridge with the priming compound contained in a separate cup located in the center of the bottom of the case. The case is thicker and can withstand more pressure.
CHAMBER	The portion at the breech end of the barrel that holds the charge.
CHOKE	A constriction of the shotgun barrel, usually in the last few inches near the muzzle, that determines the shot pattern rate of spread.

COCK	Today, the act of making the gun's firing mechanism ready to fire. In some guns it may consist of raising the hammer or operating the action to place spring tension on the firing pin so that when the trigger is squeezed it will release and fire the gun.
DAMASCUS BARRELS	A one-time popular means of constructing barrels by welding alternate strips of iron and steel around a mandrel. The method is considered unsafe for modern smokeless cartridges.
DOUBLE ACTION	The capability in handguns of both cocking and dropping the hammer to fire the gun by a single pull of the trigger.
EJECTOR	The device that casts the spent cartridge free of the firearm.
FIREARM	An instrument that fires a projectile using an explosive charge as a propellant.
FIRING PIN	The part of the action that strikes and detonates the cartridge primer. It may be attached to the hammer or in a separate position.
FLINT	A type of quartz used in the flintlock action that sparks when struck with steel.
FLINTLOCK	An action that uses quartz hitting against a steel battery (frizzen) to shower sparks into a flashpan, thus igniting the powder charge through the flashhole and firing the gun.
GAUGE	The bore diameter of a shotgun determined by the number of lead balls, each measuring the diameter of the bore, it would take to weigh one pound.
HAMMER	The part of the action that drives the firing pin forward to contact the primer.
HANDGUN	Any firearm designed to be fired with one, or both, hands.
KICK	As expanding gases force the projectile from the barrel, the firearm recoils, or "kicks."
LAND	In a rifled barrel the uncut portion, or raised spiral rib, left standing between grooves.
LOAD	A muzzle-loader's term used to refer to a charge of powder and a projectile that are loaded. In modern arms it means that the firearm is ready to fire (is loaded), or that ammunition is being placed in it (being loaded).
LOCK	The firing mechanism of a muzzle-loader, usually referred to as the action in modern firearms.

MAGAZINE The container that holds cartridges in position to be loaded into the chamber of a repeating firearm.

MATCHLOCK The first mechanical system for firing a gun, it used a smoldering "match" of flax or hemp to ignite the priming powder, which ignited the charge and fired the projectile.

MUSKET A smoothbore military shoulder gun that was a forerunner of modern shotguns.

MUZZLE The "business-end" or forward, discharging end of the barrel of a firearm.

MUZZLE-LOADER A firearm loaded through the muzzle as opposed to the breech.

PAN The small saucer-like container in the action of a matchlock, wheellock, or flintlock used to hold the priming powder.

PERCUSSION CAP An ignition device developed in the early 1800s that displaced the flintlock. A copper cap containing a pellet of detonating compound was placed over a hollow nipple and when struck by a descending hammer ignited the main charge in the barrel.

PRIMER A cap containing a small amount of explosive used to detonate the main powder charge of a firearm; located in the center or rim of cartridge cases.

PROJECTILE Any object such as a bullet that is propelled from another object such as a gun, when it is in flight.

RAMROD The straight metal or wooden rod used to push a load down the bore of a muzzle-loader barrel and seat it in place.

REPEATER A manually operated shotgun or rifle containing a supply of extra cartridges that may be loaded quickly and easily into the chamber for fast repeat shots.

RIFLE A firearm supported from the shoulder when fired. It is designed to fire a single projectile or bullet through a rifled barrel.

RIFLING Spiral grooves in the barrels of rifles and handguns that grip the bullet causing it to spin, which stabilizes it in flight.

RIMFIRE A cartridge of soft metal with the priming compound enclosed within the rim. Because of its softness, it is usually of a low pressure caliber.

SAFETY A device that is designed to lock the firing mechanism in

	place and thus prevent the firearm from accidentally firing.
SHOTGUN	A smoothbore shoulder gun that is designed to fire shot shells.
SIGHTS	One of several different types of devices on firearms used to guide the eye in aiming the firearm.
SINGLE ACTION	A revolver design that requires the hammer to be cocked manually for each shot.
SMALL BORE	Usually the expression refers to a rifle or handgun of small diameter barrel bore; it is commonly used to refer to the .22 caliber rimfire.
SMOKELESS POWDER	Propellant used today for small arms ammunition. It is a stable and non-explosive fuel that burns with a minimum of ash and smoke.
SNAPHANCE	An early form of flintlock in which the steel or frizzen and the pan cover are separate parts rather than a single part as in later firearms.
STOCK	The handle of a firearm that holds the action and barrel in proper and comfortable alignment for firing.
TRIGGER	The part of a firearm, usually under the action, that when touched releases the firing pin, thus firing the gun.
VELOCITY	The speed of a projectile usually measured in feet per second.
WHEELLOCK	An expensive and complex early action that used a serrated wheel turned by a strong clock-like spring to spin it against iron pyrite, which sent a shower of sparks into the priming pan.

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Peterson, Harold L., and Robert Elman, *The Great Guns.* New York: Ridge Press Book, Grosset & Dunlap, Inc., 1971.

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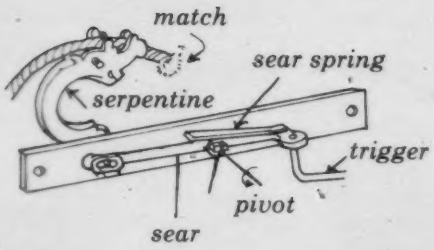
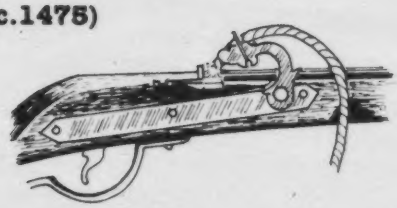
Two organizations produce numerous publications and visual aids. Their materials are available free or at reasonable cost, especially if ordered in quantities.

National Rifle Association, 1600 Rhode Island Ave., N.W., Washington, D.C. 20036.
The N.R.A. has an order form for its educational materials. Charts on firearms and firearms safety as well as films, filmstrips, and publications are available.

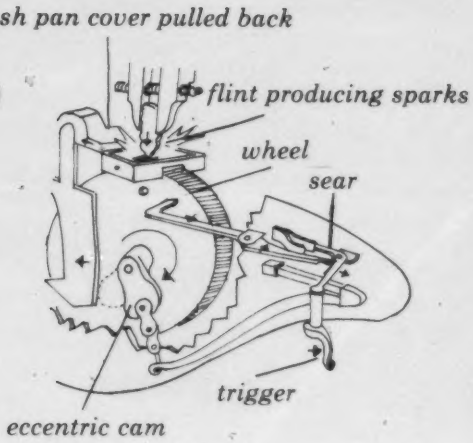
National Shooting Sports Foundation, 1075 Post Road, Riverside, CT 06878.
Some of the publications available from the NSSF are:
"NSSF Handgun Guide"
"When Your Youngster Wants a Gun"
"Firearms Safety in the Home"
"All About the Shooting Sports"
"The Ethical Hunter"

Matchlock (c.1475)

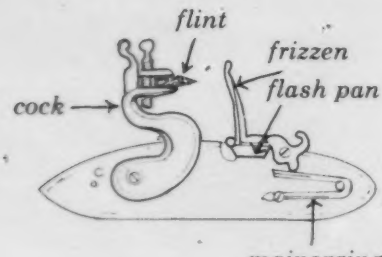


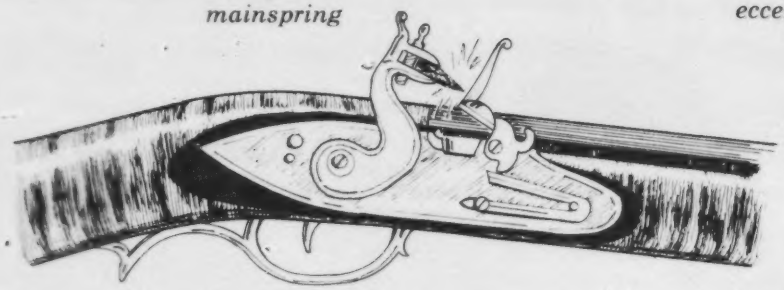


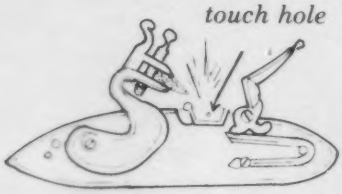
Wheellock (c.1500)



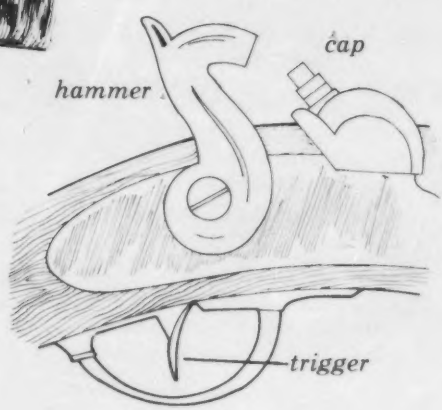
Flintlock (c.1610)



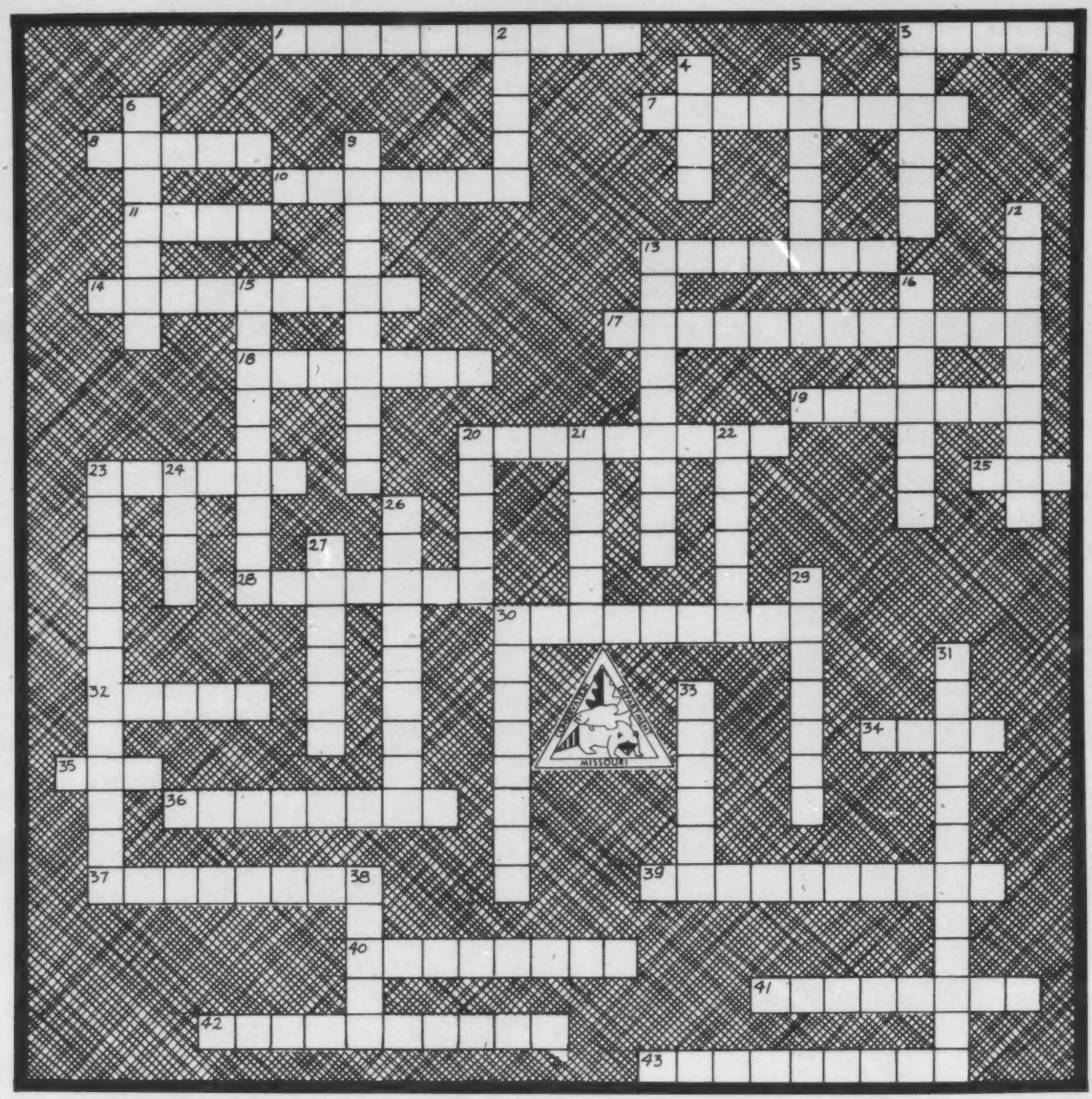




Caplock (c.1825)



Appendix 2—History of Firearms Crossword Puzzle



Alphabetized list of words in the crossword puzzle:

Bacon
Ball
Breechload
Bullets
Cannon
Cap
Caplock
Carbine
Centerfire
Clay
Colt
Corned
Firearms
Flint
Flintlock
Forsyth
France
French
Gun
Gunpowder
Gunsmith
Hall
Harquebus
Hawken
Kentucky
Lever
Magazine
Match
Matchlock
Musket
Muzzleloader
Passenger
Pennsylvania
Percussion
Potassium
Repeating
Revolver
Rifle
Rifling
Shaw
Smith
Snaphance
Spanish
Trapshooting
Trigger
Wesson
Wheellock
Whitney
Winchester

ACROSS:

1. In 1873 it was "the gun that won the West."
3. A hard stone that produces sparks when struck against some metals.
7. Type of pigeons used that created the sport of trapshooting in 1875.
8. He is given credit for inventing and publishing the recipe for gunpowder.
10. Last name of the Scottish clergyman who invented and patented a priming powder.
11. Ammunition for a cannon.
13. Besides inventing the cotton gin, he conceived the idea of interchangeable gun parts.
14. The firearm that was the father of the flintlock.
17. State where German and Swiss immigrants developed the Kentucky rifle.
18. Grooves in the barrel originally designed to collect black powder residue; spins the bullet giving it greater distance and accuracy.
19. Invention in 1836 which made a patch no longer necessary and decreased loading time.
20. It was the first firearm to have a lock, stock, and barrel.
23. A firearm that could pierce armor was first carried by Spanish foot soldiers.
25. An instrument consisting of a metal tube from which a projectile is discharged, usually by the burning of gunpowder.
28. They were the first to use the harquebus around 1500.
30. Roger Bacon is credited with developing this important invention.
32. Type of action on the first American firearm to use smokeless powder; still popular.
34. Type of pigeons used today for trap and skeet shooting.
35. A small metal _____ containing gunpowder that explodes when struck; formerly used in firearms to set off the main charge; the most notable type was created by a Philadelphia artist.
36. First truly American rifle.
37. Handgun with a rotating cylinder.
39. The impact of one object against another, as the hammer of a firearm against a powder cap.
40. During the Western frontier days people were dependent upon these tools.
41. In 1860 Spencer and Henry developed this reservoir to hold cartridges in a firearm.
42. Berden and Hartley of the Union Metallic Cartridge Company designed this cartridge with the primer set in the middle of the base.
43. Type of rifle of which the Henry and the Spencer were Civil War examples.

DOWN:

2. The two men who introduced the first metallic
& 5. cartridge, 1859.
3. Nationality of the chemist who developed smokeless powder.
4. He patented in America the first practical firearm to be loaded at the rear of the barrel (breech loader).
6. Sharps short, light rifle used by the cavalry during the Civil War.
9. To load at the rear of the barrel.
12. One of the two ingredients of the percussion explosive powder developed in 1807, _____ chlorate.
13. As the successor to the matchlock, it replaced the "wick" with a flint and steel igniter, which did away with the problem of the smoldering match.
15. An obsolete portable firearm that had a matchlock operated by a trigger and was supported by a forked stick for firing.
16. Replaced the flintlock during the 19th century as a method of ignition.
20. Developed early in the 15th century, it replaced old-fashioned methods of igniting powder.
21. Used at the Battle of Crecy around 1346; the first portable firearm.
22. First major improvement in gunpowder, 1550.
23. A firearm loaded through the front end of the barrel.
24. Last name of the Philadelphia artist who designed the percussion cap.
26. A gunlock in which the powder is exploded by a spark produced by the striking of a flint in the hammer against a metal plate.
27. Brand name of the St. Louis-built plains rifle.
29. First developed as the lower end of the serpentine; today it is the part of a lock moved by the finger to release the cock for firing.
30. Occupation of Casimir Lefaucheux, who invented the breech loader that used a pinfire shotshell.
31. Sport objected to by the Society for the Prevention of Cruelty to Animals.
33. Country credited with the development of the flintlock.
38. Between 1870-1900 Colt became synonymous with "revolver" whereas Winchester meant " _____."

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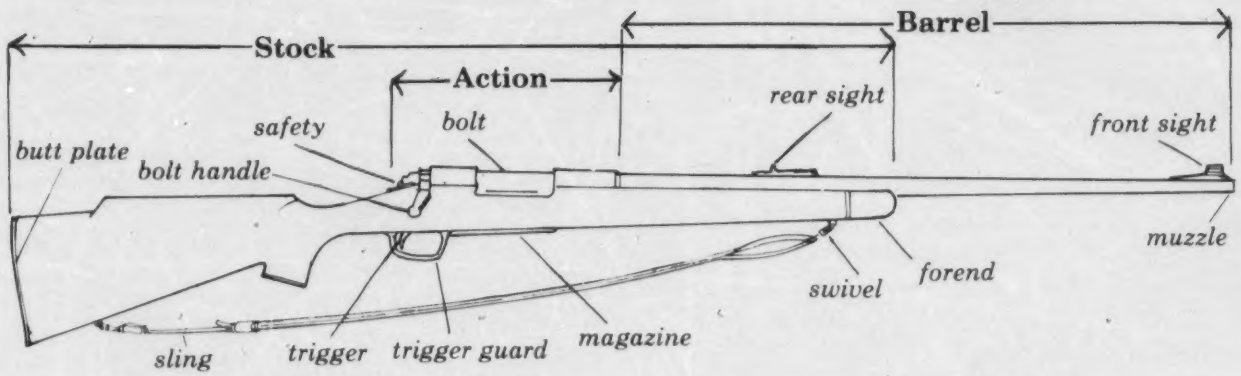
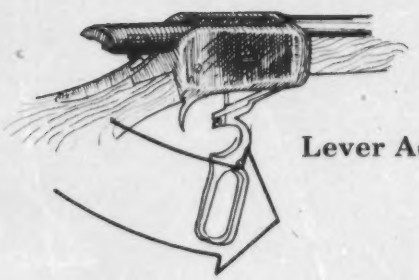
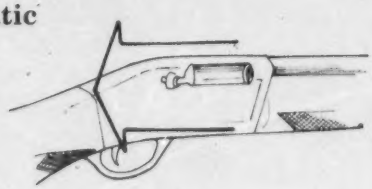
Appendix 3—Parts of a Firearm

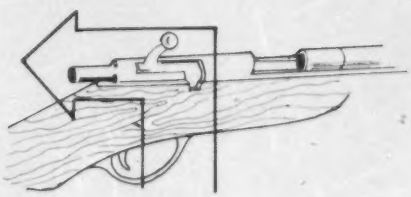




Lever Action

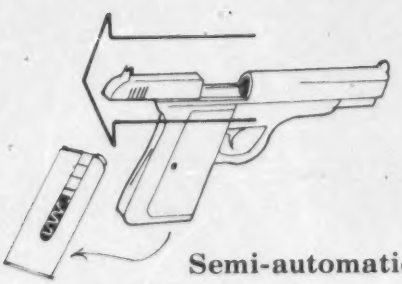
Semi-automatic Action



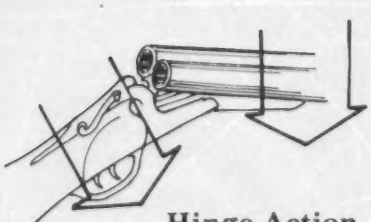


Bolt Action

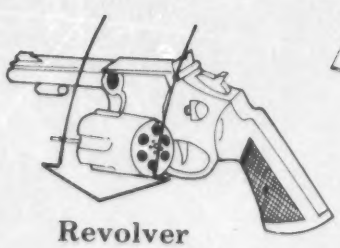
Pump Action



Semi-automatic Handgun



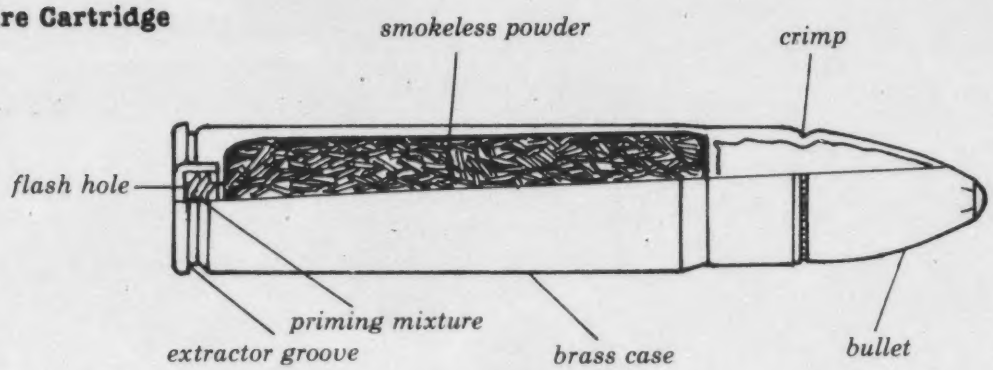
Hinge Action



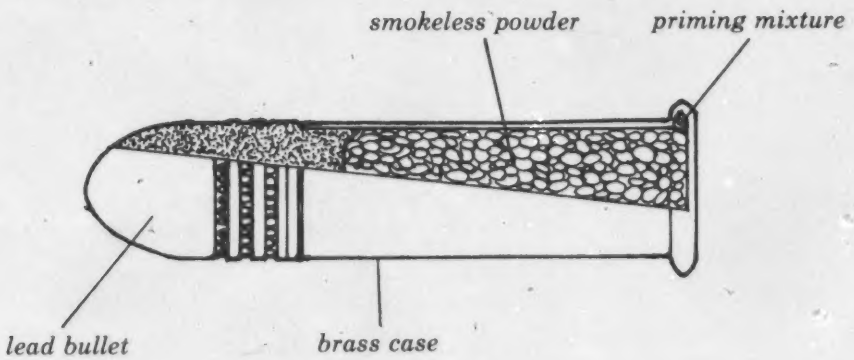
Revolver

Appendix 4—Ammunition Components

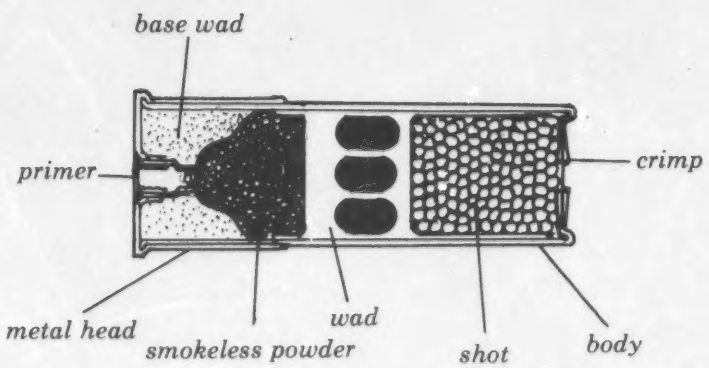
Centerfire Cartridge



Rimfire Cartridge



Shotgun Shell



Appendix 5—Home Firearms Check List

Do you know what firearms are in your home? How are these firearms stored? Where is ammunition stored? Answers to the following questions should be YES; if not, your firearms may not be as safe as they should be.

Firearms

Type of firearms	*Caliber or Gauge*	*Action*
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

_____ Are firearms unloaded?
_____ Are firearms stored in a rack or case?
_____ Is rack or case always kept locked?
_____ Were firearms cleaned and checked before they were stored?
_____ Are metal parts of firearms free of rust?
_____ Are metal parts free of heavy grease or oil?
_____ Are bores clean and free of obstructions?
_____ Do actions work freely?
_____ Do triggers work freely?
_____ Do safeties function properly?

Ammunition

_____ Is ammunition stored in a separate place?
_____ Is ammunition locked up?
_____ Is ammunition clearly marked as to what size it is?

Firearms Users

_____ Have the users had Firearms Safety or Hunter Safety training?
_____ Do users treat all firearms as if they were loaded?
_____ Do users make it a practice to always carry a firearm so the muzzle is under control?
_____ Do users always check that ammunition is the proper caliber or gauge for their firearms?
_____ Do users always unload firearms before bringing them into the home?
_____ Do users always unload firearms before transporting them in a vehicle?
_____ Do users carry firearms in a case or with action open when transporting them?
_____ Are all members of the family familiar with the firearms in the home?

Appendix 6—Word Game Using Firearms Phrases

FIREARMS PHRASES
Use to fill in the blanks at right. Use each word only once.

"Hold your fire"
"Hit it dead center"
"Chewin' the rag"
"A shot in the dark"
"Fell short of the mark"
"Target"
"Triggered"
"Drew a bead"
"Went off half-cocked"
"Misfired"
"Lock, stock, and barrel"
"Straight shooter"
"Double-barreled"
"Loaded for bear"
"Straight as a ramrod"
"Keep your powder dry"
"Fire away"
"In her sights"
"Ramrod"
"Line of fire"
"Powder keg"
"Hanging fire"
"Overshot the mark"
"Primed"
"Hair trigger"
"A flash in the pan"
"Shooting blanks"
"Trigger man"
"Hit the bull's-eye"
"Set his sights"

1. The football game plan _____. *(The event didn't occur as planned.)*

2. Mr. Newton is a _____ boss. *(He is very demanding, rigid, and severe.)*

3. The principal has a _____ temper. *(He exerts little control over his temper.)*

4. The student _____ on passing the exam. *(Passing the exam has become his goal.)*

5. John was so angry that he _____. *(He said something before he had given enough thought and was prepared to react.)*

6. The player _____ on the basket and let fly. *(He took aim.)*

7. _____ before you say another word! *(Do not complete the action.)*

8. The company purchased the gun shop _____ _____. *(They purchased everything, or all parts.)*

9. The committee is _____ for the occasion. *(They are well prepared and ready to react.)*

10. The _____ for the drive is $10,000. *(The objective or goal.)*

11. The divers _____. *(They went beyond the established goal.)*

12. The benefit _____ needed to purchase the equipment. *(It was less than the established goal.)*

13. You _____ with that remark. *(You were exactly right.)*

14. The chairperson came _____. *(He or she was well prepared, perhaps ready to do verbal or physical combat.)*

15. The new member is already the _____ of the firearms training program. *(He is the key individual who gets the program started.)*

16. The call was just _____. *(It was just a chance attempt at accomplishing a goal.)*

17. The stock was as _____ . *(It was extremely straight.)*

18. The researcher felt as though she had been _____ _____ all week. *(She was working hard but not accomplishing her goals.)*

19. The instructor is a _____ . *(He is honest and fair.)*

20. The announcement is _____ . *(It is about ready to be announced.)*

21. Whatever else is done, _____ . *(Keep prepared with equipment ready.)*

22. The psychologist's analysis of the problem _____ _____ : *(She was absolutely correct.)*

23. _____ with the questions. *(Get started, ask, do the task.)*

24. The politician's stand on the issue put him in the _____ _____ . *(His viewpoint was not in agreement with others who would argue with him.)*

25. The accountant had the promotion _____ . *(She had an established goal she wanted to achieve.)*

26. His letter _____ his dismissal. *(It brought about his dismissal.)*

27. The school has a _____ program of study. *(It has an emphasis in two major areas. The term also can be used to mean complex or varied.)*

28. The newly formed Latin American country is a _____ _____ . *(It is unstable and may react violently.)*

29. The new plan is just _____ . *(It will have no concrete results.)*

30. The two old gents were just _____ . *(They were visiting about nothing of importance.)*

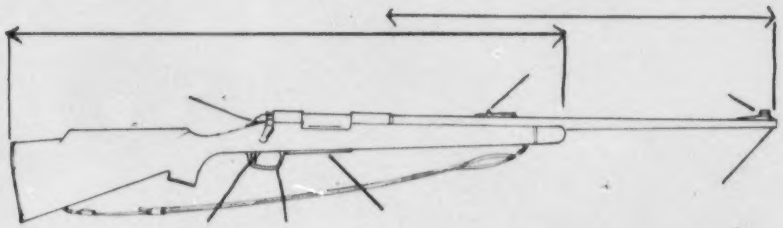
Appendix 7—Suggested Written and Practical Examinations

Written Exam

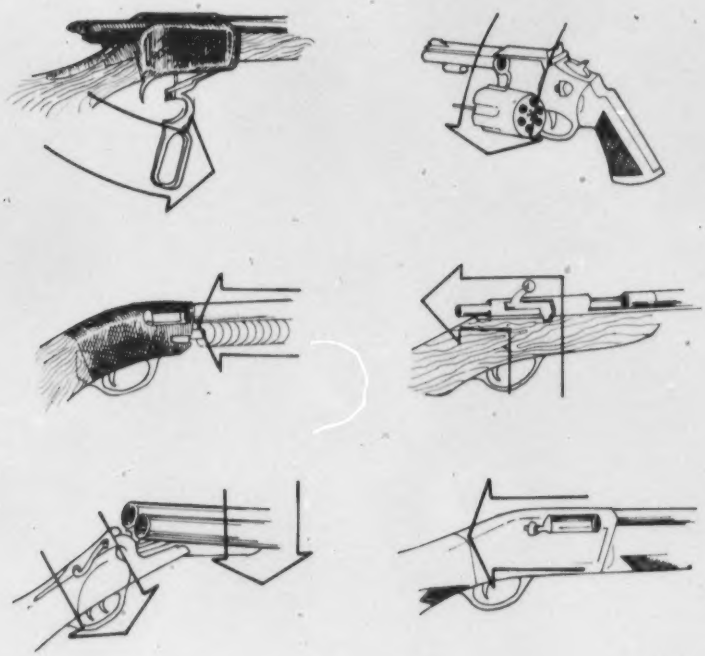
1. What is a firearm?

2. What are the three major firearms? Describe each.

3. Label the following parts of the firearm diagram shown here: barrel, stock, trigger, trigger guard, muzzle, safety, sights, magazine.



4. Label the actions and for each write a short paragraph which describes how to safely open and check the action to determine if the firearm is loaded.



5. List the four components of a cartridge.

6. List the five components of a shotgun shell.

7. What is the function of the *primer* in ammunition?

8. What is the purpose of a *wad* in a shotgun shell?

9. In two or three sentences, define the following terms:
   a. caliber
   b. gauge
   c. rifling
   d. choke
   e. centerfire cartridge
   f. rimfire cartridge

10. What are the three basic rules of firearms safety and why is each important?

11. Discuss proper firearms safety in each of these instances:
   a. firearms and ammunition stored in the home.
   b. firearms carried while hunting or shooting outdoors.
   c. firearms transported in a car.

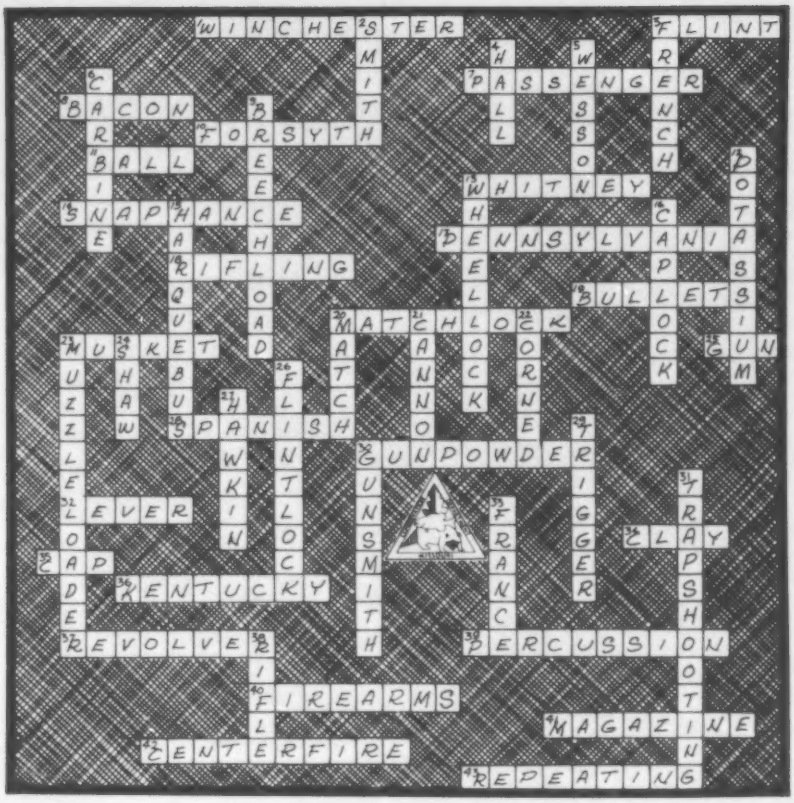
Practical Exam

Students' knowledge of firearms safety can best be tested by observing them while they actually handle firearms. For this reason a practical, as well as written, examination is suggested. In the classroom or outside, students should be asked to do the following:

1. Identify and open each type of action.
2. Check each action to make sure it is loaded.
3. Demonstrate proper muzzle control and direction.
4. Demonstrate how to safely carry a firearm with the two-hand carry.
5. Demonstrate how to cross a fence or ditch with a firearm.

Appendix 8—Instructor's Key

Crossword Puzzle

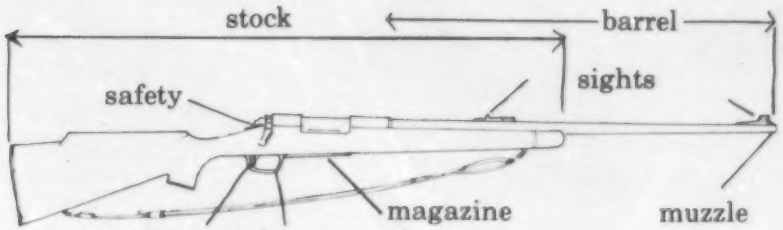


Word Game

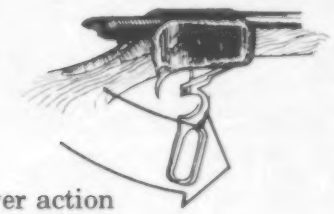
1. misfired
2. ramrod
3. hair trigger
4. set his sights
5. went off half-cocked
6. drew a bead
7. hold your fire
8. lock, stock, and barrel
9. primed
10. target
11. overshot the mark
12. fell short of the mark
13. hit it dead center
14. loaded for bear
15. trigger man
16. a shot in the dark
17. straight as a ramrod
18. shooting blanks
19. straight shooter
20. hanging fire
21. keep your powder dry
22. hit the bull's eye
23. fire away
24. line of fire
25. in her sights
26. triggered
27. double-barreled
28. powder keg
29. a flash in the pan
30. chewin' the rag

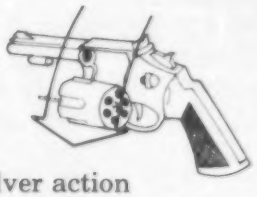
Written Examination

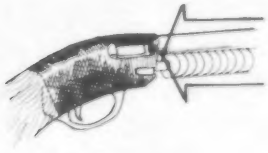
1. A firearm is an instrument that fires a projectile using an explosive as a propellant.
2. *Rifle* is a shoulder firearm (stock is fitted to the shoulder) with a relatively thick and heavy barrel that has rifling, or spiral grooves, cut in it. A rifle fires a single projectile.
   Shotgun is a shoulder firearm with a thin-walled and smooth barrel. A shotgun fires shot or pellets.
   Handgun is a short firearm that can be held and fired with one or two hands. Like a rifle, it has rifling in its barrel and fires bullets.
3.

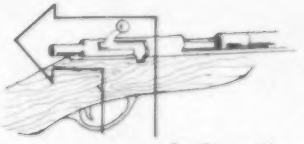


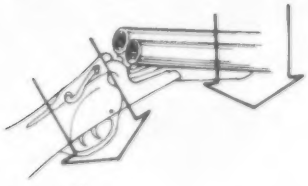
4. For a description of how to safely open and check each action, see pages 27-29.

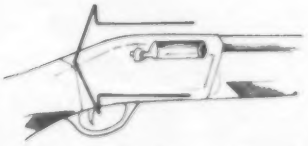

lever action


revolver action


pump action


bolt action


hinge action


semi-automatic action

5. case, primer, powder charge, bullet
6. case, primer, powder charge, wad, shot
7. When the primer is struck by the firing pin it explodes into a flame which serves as a "match" to ignite the powder charge in the cartridge or shotgun shell.

8. The wad separates the powder and shot charges and prevents the gas from escaping through the loose shot as it travels out the barrel.
9. a. *Caliber* is the diameter of a rifled barrel measured from land to land in fractions of an inch. It also designates the ammunition that the firearm shoots.
   b. *Gauge* is the bore diameter of a shotgun determined by the number of lead balls, each measuring the diameter of the bore, it would take to weigh one pound.
   c. *Rifling* is the spiral grooves in the barrels of rifles and handguns. Rifling grips the bullet, causing it to spin and thus stabilizing its flight.
   d. *Choke* is the constriction near the end of a shotgun barrel that determines the shot pattern rate of spread.
   e. A *centerfire cartridge* has the priming compound in a separate cup located in the center of the bottom of the case. It is thicker and can withstand more pressure.
   f. A *rimfire cartridge* has the priming compound enclosed within the rim and is softer.
10. See pages 36-37.
11. See pages 37-39.

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Jackson, MO 63755
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Aurora, MO 65605
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California, MO 65018
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Shelbina, MO 63468
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